

# technology review

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# The Technology Review

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## ROBERT C. BILLINGS

It should be a subject for gratulation to friends of the Institute to note how hearty is the support given it by business men, who, though they could not have in their youth those advantages of education which it affords, have grown to appreciate its usefulness in the city, State, and nation, and have come to realize the considerable degree of success it has attained in solving the difficult problem of giving a student, within the short space of four years, a thorough familiarity with the underlying principles of his profession, and sufficient knowledge of its technique to enable him to enter at once on the practice of it, while fulfilling the requirements of a broad and liberal education.

Of the late benefactors of the Institute, none better illustrates the broad-gauged view which successful business men take of the value of scientific education and research than Robert Charles Billings, whose large bequest to the Corporation was announced a few months ago. Mr. Billings was a Bostonian of Bostonians, made of the sturdy New England stock, and imbued with that resolute spirit which carved the new nation out of the wilderness, and placed Massachusetts on the firing line of progress. To him life was a battle to be fought—and won. There must be no compromise with wrong, no concession to weakness. He

believed that every man had within him the germ of success, and that it was for him to develop it, and nourish it, until it made him the master of his work and the peer of any of his competitors. To him nothing that contributed to this end was trivial or insignificant: no detail was to be neglected, no task left undone. He knew that true greatness was builded on firm foundations, and that every plank in the structure must be sound and every nail driven home. He demanded of himself the utmost accuracy and punctuality. He left his house for his place of business at exactly the same time every day, and he arrived there on the tick of the clock. He went to his lunch at five minutes of noon, and re-entered his office at precisely one o'clock. So punctual was he, indeed, that his neighbors often remarked that they set their watches by him, when they saw him coming up the street. In his life he was the most temperate of men, doing everything in moderation, nothing in excess. He believed that most disease was due to over-eating and over-drinking; but he abstained from nothing that was harmless and innocent, and had none of the Puritan's distaste for the good things of life. He had the best of everything, but he regulated his diet by the strictest hygienic rules. In the matter of exercise he was also particular; and, although he kept excellent horses in his stable, he took frequent long walks, always walking to and from the Park Square Station to his store on Franklin Street. In fact, even up to the last year of his life, he could often be seen running across the Common, like a boy. This careful observance of the rules of health made him at seventy-five as vigorous and active as many men at forty-five. He climbed the steep hill upon which his beautiful house was built without the slightest weariness or fatigue; and, until his last illness, he never knew a sick day.



It may be thought that one so precise in business and so methodical in his living would fall into the ruts of tradition and prejudice; but it was not so. He took a keen pleasure in his business success and in his long-continued and vigorous health; yet he never conceitedly attributed these to any unusual natural ability, but believed them to be the results of will-power and discipline, which others might exercise if they would, and thereby attain a corresponding success. He admired industry and ability in others, and especially liked those who "made something of themselves," who used their talents, no matter in what direction they might lie. He worshipped honorable success in all lines.

Mr. Billings was pre-eminently a self-made man. From humble beginnings he rose to be one of Boston's foremost merchants. From poverty he attained wealth. From an insignificant office-boy, sweeping floors and running errands, he became the millionaire owner of one of the finest estates in Jamaica Plain. And, best of all, he won it honestly. In his long business career there is no instance of unfairness to competitors or employees, no blemish or stain on his name. His integrity was adamant: it might be assailed, but it could not be shaken. He was a man with a strong moral nature and an iron will.

A fine feature of Mr. Billings's character was his devotion to his mother and his veneration for her memory. He often spoke of her as the inspiration of his life, and told of her sacrifices and fortitude under most trying circumstances. His father, who was a ship-chandler, failed in business; and his mother refused to take the property which was legally hers, saying that the creditors should receive every cent available. The son gloried in her action; and declared, that in times of temptation in his business life, it had often been a source of help to him.

His parents were devout members of the old Brattle Street Unitarian Church, and he was always an active member of and liberal contributor to that denomination. While a resident of Boston, he attended the South Congregational Church, of which Rev. Edward Everett Hale is the pastor; and on his removal to Jamaica Plain he joined the Unitarian church there, and bore the expense of erecting a stone tower upon its meeting-house. He was a constant attendant, and was always seen in his pew, whatever the weather, up to the time his late illness confined him to the house.

He was born on Fort Hill in Boston, January 3, 1819, and lived in the city all his life, dying June 12, 1899, in his eighty-first year. He was the son of Ebenezer and Elizabeth (Cleverly) Billings, both of whom came from old colonial stock, his father being of the Billings family of West Roxbury, and his mother of the old Nash family of Weymouth. He attended the public schools of Boston, and won one of the Franklin medals for scholarship, but entered upon his business career at the early age of fourteen, when he obtained a place in the dry-goods jobbing house of Thomas Tarbell & Co. in State street. He remained with this firm and its successor all his life, a period of sixty-six years, and died its senior member and chief owner,—a record rare, indeed, in these days of constant changes. His industry and ability attracted the early attention of Charles Faulkner, a member of the firm, who took him into his confidence and promoted him to a position of responsibility, which he filled with such fidelity as to lead to a lifelong friendship between the two men. Mr. Billings was soon taken into the firm, and remained with it through all its various changes in name and *personnel*. At the time of his death he was one of the oldest

men engaged in active business in Boston. He was twice married, but left no children.

Mr. Billings left what has been well called "a noble will." He bestowed all his vast wealth with remarkable discernment and discretion; and the leading institutions of learning, as well as many of the most worthy charitable societies, have cause to bless his memory. He bequeathed the Institute of Technology, without restriction, the sum of one hundred thousand dollars, with an additional fifty thousand to found the "Billings Student Fund," with the understanding that any student receiving benefit from the fund is expected to abstain from the use of alcohol or tobacco in any of their varied forms. It will be noted that he does not require the signing of a pledge or previous abstinence, but leaves it to the honor of the student to carry out his wishes. Bequests of one hundred thousand dollars each were also made to Harvard University and to the Boston Museum of Fine Arts; while twenty-eight other institutions, including numerous hospitals, colleges, and some religious establishments, were donated amounts varying from ten to fifty thousand dollars.

ARTHUR A. NOYES, '86.



A Corner of the Cloister,  
Saint Trophime, Arles.

## A DAY IN PROVENCE

During the first weeks of the tour of the Summer School of Architecture, we had been looking forward to the architectural treasures of the Rhône valley, and, while pushing our bicycles over the long mountain grades of the Riviera, had often comforted ourselves with thoughts of the level country ahead. The eastern edge of the great plains of the Camargues, however, is quite broken by rocky hills and ravines; so, as we journeyed from Marseilles in the afternoon train, stopping at all the little stations of a branch road, our approach to Aix was varied by numerous tunnels leading to the long curved viaduct over the river Arc.

On either side, the deep green valleys, the water-worn rocky hills, and even the gray house-tops of occasional villages seemed to tell of the ancient character of the land. Far older in appearance than the fertile plain of northern Italy or the mountains of the Riviera, the environs of Aix harmonize with the tradition of this most ancient Roman settlement of Gaul, the resting-place of the legions of Marius and Cæsar. But the baths, palaces, and temples of Aquæ Sextiæ, visited by consuls and patricians as early as the second century before Christ, were destroyed by the Saracens in the eighth century, and the modern city gives little evidence of its former splendor. Aix-en-Provence is, however, a most interesting town. Its broad boulevards shaded by dense screens of foliage, its numerous fountains, statues, and large modern buildings indicate that the former capital of Provence is to-day deeply interested in progressive municipal government.

Taking our bicycles from the train, and seeing that no

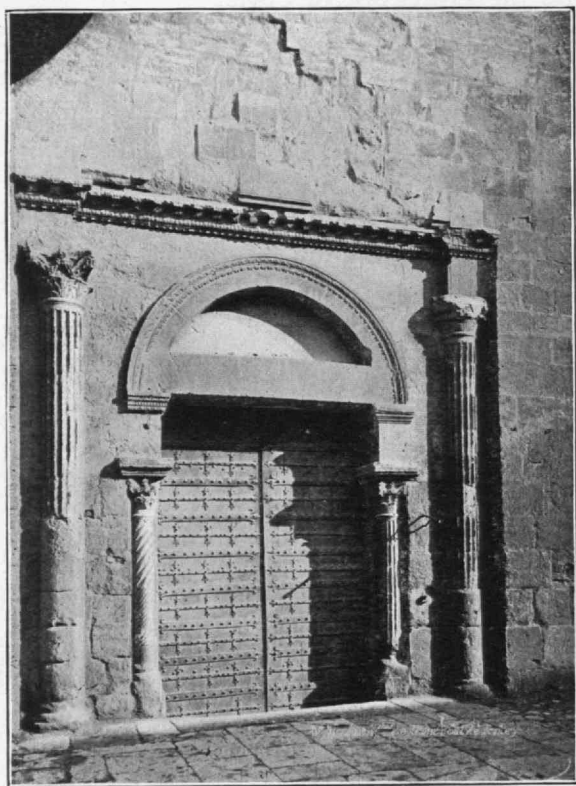


Hôtel de Ville and Belfry, Aix.

repairs were needed, we soon wheeled into the shadows under the leafy covering of the magnificent Cours Mirabeau, and at last, among the larger houses of the northern side, found the Hôtel Nègre Coste.

In the early morning, after paying for a table d'hôte dinner, a bed, and a good breakfast the moderate sum of six and one-half francs each, we oiled bearings and made all ready for the fifty-mile ride before us. Deciding that we had not time to visit the paintings and antiquities of the Museum, or the modern buildings of the École Nationale des Arts-et-Métiers, we bumped along the rough stones of the older streets, passing the colonnade of the Palais de Justice and the memorial obelisk fountain in the Place des Prêcheurs. At the upper end of the Place we stopped to examine the Dominican church of Sainte Marie Madeleine, attracted by M. Révoil's bold Renaissance design for the façade. Thence by devious ways we went on past the prisons and corn market to the Hôtel de Ville and belfry. Only the narrow end of the Hôtel de Ville faces the public square, and this side gives little idea of the real extent of the building. Its modern additions somewhat disturb the original design; but its three stories certainly show Renaissance details that in general character are far more Italian than French. Close to the corner rises the belfry, erected one hundred and fifty years earlier than its seventeenth-century neighbor,—a plain mass of stonework that is varied only by the archway and heavy cornice, although the plain walls are a little softened by the Gothic decorations and the Renaissance sculpture around the old clock face, and relieved by the curious wrought-iron railings and bell spire. During our tour in the Rhône valley we noticed many bell spires resembling this open structure at Aix; but some were far richer in detail, with wrought-iron work showing great variety in design.

Coming at last to the square in front of the Cathedral, we placed our wheels against the walls of the Académie, and began our search for architectural traditions. No better

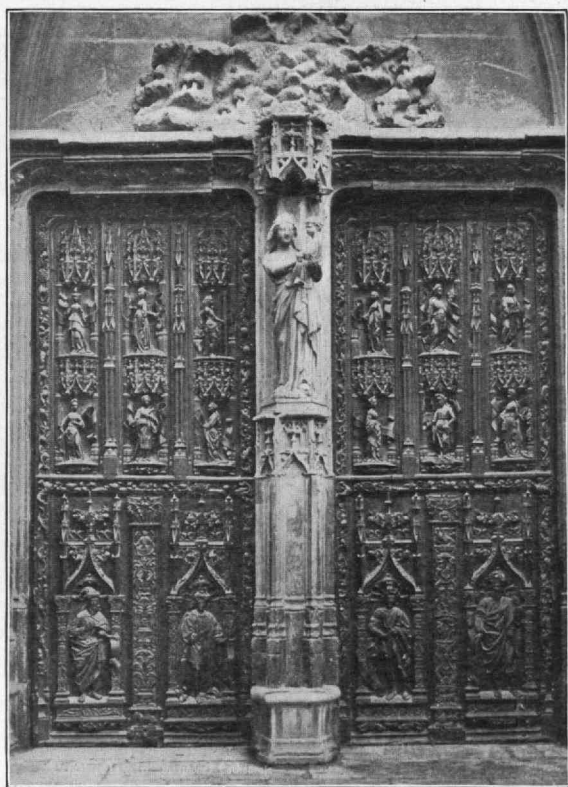


Aix Cathedral — Eleventh-century Door.

example of changes in the development of French mediæval architecture could be chosen than that offered by the two entrance doors of the Cathedral of Saint-Sauveur. The southern door opening into the nave of the eleventh-century church has the Romanesque corner columns, raised circular arch, and carved horizontal mouldings of the earli-



est Provençal type,—a development from local Roman monuments and Eastern churches. On the other hand are found in the decorations of the central portal all the ele-



Aix Cathedral — Fifteenth-century Door.

ments of northern Gothic work. Its deeply recessed and moulded archway, flanked by strong yet richly decorated buttresses, its canopies, statues, and double doors of curiously carved woodwork, show the elaborate treatment of the latter part of the fifteenth century.

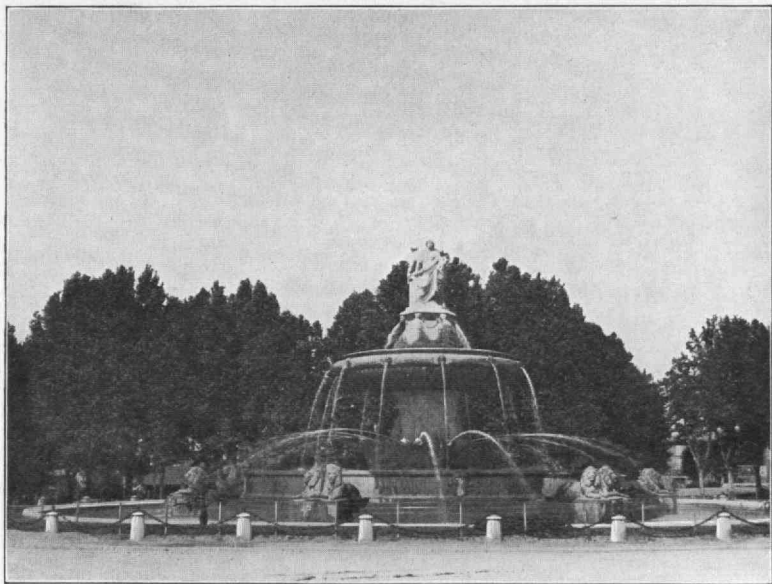
The interior of the church, moreover, has a similar vari-

ation in style. Of the three naves the southern is by far the most interesting to the architectural student, because of its simple treatment of pointed stone vaults and arches. Near the middle of the old nave the usual Provençal vault design is varied by the introduction of a ribbed octagonal dome that rests, with the help of conical trumpets, upon four large circular arches,—a unique arrangement, entirely in keeping with the rest of the roof, yet serving to enlarge and emphasize the central part of the nave after the fashion of the domical Byzantine churches of the East. Opening off this nave is the octagonal room or baptistery, still retaining its sixth-century form and possessing eight antique marble and granite columns that originally came from a pagan temple of Apollo, erected on the same site.

But the gem of the whole is the little Romanesque cloister placed on the south side of the church and surrounded by the walls of the Archbishop's Palace. This is one of the most interesting examples of monastic architecture in this part of France, since within its small area a great variety of carved capitals, piers, twisted and coupled columns, and arch decorations is still in fairly perfect condition. Last summer the arches of one side required the assistance of wooden supports, but it is to be hoped that all necessity for temporary braces will soon be removed and the whole arcade properly restored.

Returning from the Cathedral to the new part of the town by way of the Boulevard Notre-Dame, we skirted the walls and gardens of the city "thermal establishment," which dates from the baths constructed in 124 B.C. by the Roman consul Sextius Calvinus. However, as little of the original structure now remains, and water at 97 degrees temperature did not seem inviting on a warm July morning, we continued our way to the Place de la Rotonde, to

see by daylight the fine fountain we had passed the night before when entering the city. Placed at the centre of a large open circle formed at the junction of three boulevards and two streets, the Fontaine de la Rotonde has within its



Fontaine de la Rotonde, Aix.

huge ninety-foot basin a generous play of water, that in this region of brilliant sunshine is particularly refreshing to eye and ear. Crouching lions, boys and swans, dolphins and conventional ornament help to vary the regular lines of the three huge basins. The top is finished by three standing figures, Justice, Arts, and Agriculture. These face the three principal avenues, but seem small in scale for such a conspicuous position.

Taking the boulevard to the right of the fountain, we were soon riding over the national route to Nîmes, having first a stiff climb out of the valley of the Arc. At the

top of the hill we found ourselves at the beginning of one of the long straight runs common to the great first-class roads of France. For seven long miles we rode up and



National Road — Aix to Lambesc.

down hill, over a dazzling white surface and without shelter from the intensely hot sun. Fortunately, the two-mile coast down to the railroad crossing diminished the labor; but, after we reached the rising grade, there was little respite until we came to the bend in the road at La Pile.

Dismounting in the shade of the trees around the Fontaine d'Armeux, we drank as freely as we dared from the carved water-spout, thrust arms and heads into the dark waters of the great stone washing-basin, and then tried to cool off by lying on the grass and watching farm life about the solitary house on the other side of the road. And what a welcome relief to our burned eyes the green shadows and

cool water afforded after the blinding sunlight of the roadway! No more fatiguing work can be found than the monotonous pedalling along such a great national road. We therefore were in a position to appreciate the task of the helmeted postman who stopped to deliver a letter at the farm-house, and then courageously pegged away in the



Lambesc from the hill-top.

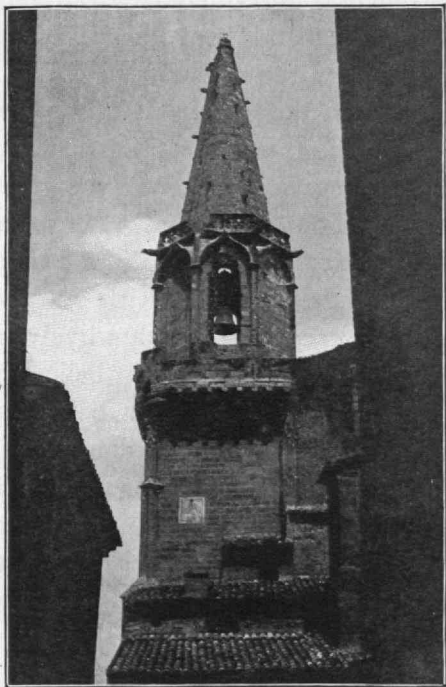
heat and sunlight. After our short rest we passed into the sunlight again, and the distance to St. Cannat was quickly covered. But we stopped in the village streets only a short time, to look at the ancient tower of the church, and to examine several interesting though half-destroyed fragments of Renaissance houses, possibly the remains of a château of the Bishops of Marseilles. The doorways and window mouldings of these buildings seemed unusually weather-worn and battered, probably on account of the exclusive use of soft stone for the façades. Taking the right fork of the road at the centre of the

village, we rode some three miles farther on, continually ascending over barren, rolling hill-tops until we reached the summit and looked down into a narrow valley where the grey roofs of Lambesc were surrounded by a green wall of trees.

Though the Guide Joanne states that Greeks from Marseilles established a prosperous market here, that Lambesc was a thriving town in the sixth century and had its own lords in the Middle Ages, at present the nearest railway is eight miles away; and all traffic and communication are carried on by the great roads alone. We expected to find interesting buildings in this town, and we were not disappointed. It proved to be a rambling place, built on the slope of the hillside and divided, after the fashion of most of these old southern cities, into old and new quarters. In the upper part of the lower section rises the ancient clock tower, bearing an iron belfry even more elaborate than that seen at Aix. Many very old houses line the narrow side streets, the Renaissance houses apparently predominating in the section we visited. But we were searching for the dome of the church that we had seen from the hills, and did not stop to examine the tower details.

The church is placed on the north side of an irregular square surrounded by high houses, and has a broad, uninteresting Renaissance façade, decorated with engaged columns and horizontal entablatures. The interior is overloaded with pilasters, but as a whole is dignified and sombre in aspect because of the dark color of the stone and the method of top-lighting through the windows of the central dome. The details of both exterior and interior suggest Italian influence throughout. The fact that the town was almost completely destroyed in the wars of the thirteenth century may account for the absence of older details in the body

of the building. The most attractive part, however, is the Gothic spire that rises on the west side of the nave from the fortress-like walls of what seem to be the remains of a Romanesque church. Because of its bold shadows



Church Spire, Lambesc.

and graceful window decorations, this fragment is crisp and vigorous, especially when compared with the cold details of the rest of the building.

A little later, while seated at a café table, drinking a bottle of "limonade," we were much amused by the arrival of the steam omnibus from Cavaillon,—a huge vehicle that with infinite labor puffed and rattled up the stiff grade of the main street. When we passed the noisy apparatus on



our quiet bicycles, although it had stopped to discharge passengers, it still kept up an infernal racket, to which every one on board seemed entirely oblivious. From several incidents of this sort, we at last came to the conclusion that French countrymen have an innate love for machinery, the utility and convenience of the apparatus having little to do with the question.

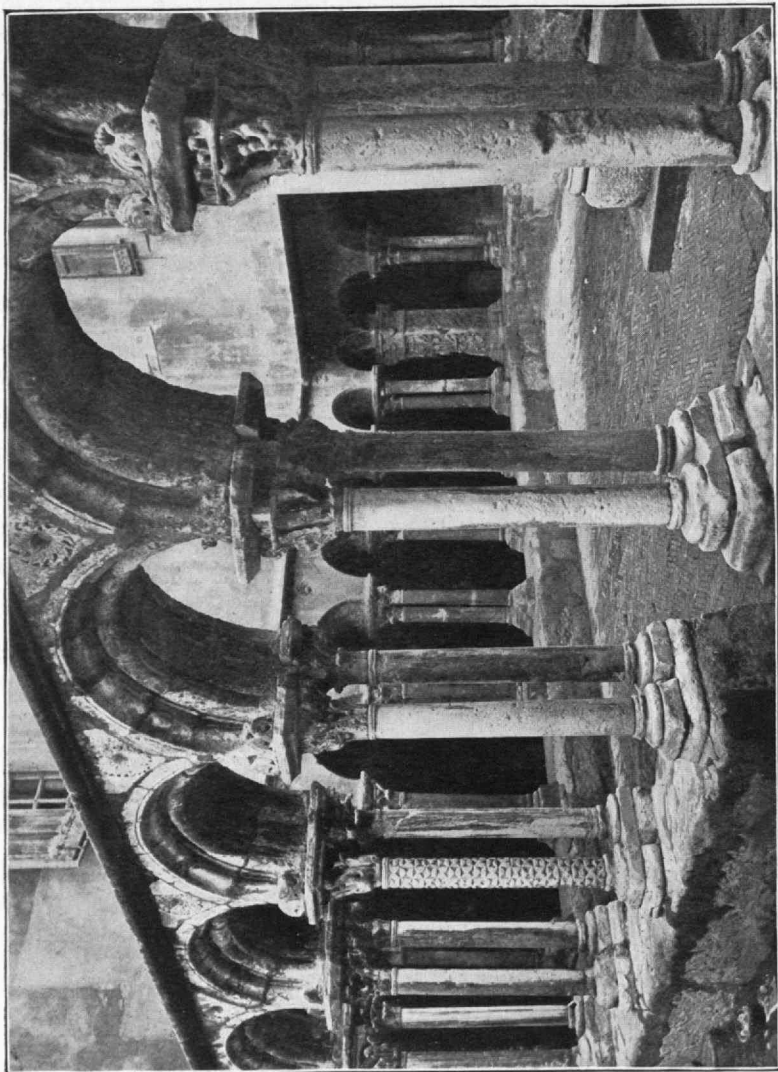
At Lambesc we left the national highway behind us, and started on a delightful run down a narrow, winding road, with good macadam surface, following the green valley of a little branch of the Touloubre,—a grateful contrast to the white road-bed and dry hills we had just passed over. The continuous down grade, combined with our fears of a late arrival for déjeuner, encouraged such a lively pace that we rushed into Pelisanne before we could believe the necessary distance had been covered. Here a belfry with iron top and a curious group of church buildings detained us only a short time, for the pangs of hunger prevented a just appreciation of what seemed to be quite ordinary mediæval work. Pushing on around the church, which stands directly in the way of the present main road, we hurried on to Salon, where, after inquiring the way of a local bicyclist, we arrived at the Grand Hôtel, late, but welcome to all the house afforded. Iced siphon, good local wine, and a generous dinner soon repaid us for our forced pedalling, but, sad to say, took away all ambition for the long afternoon trip originally planned. Tired muscles, once relaxed, recover slowly; and our hot morning ride seemed discipline enough for that time. Yet our original plan was to reach Arles before night, that we might be ready for the entertainment promised for the Fourteenth, the French Fourth of July.

An afternoon train was naturally the first suggestion. The map showed a railroad through Eyguieres, Paradou,



and Fontvielle, towns that we had hoped to visit, on the northern edge of the great plain; but consultation with our landlord brought out the sad fact that the afternoon train over this *chemin de fer régional* left Salon at about six, and arrived at Arles about nine in the evening, taking three hours to drag its coaches and stone-laden cars over the twenty-eight intervening miles. The only alternative at first seemed to be the straight national road; but, as we had had enough of national routes for that day, it was decided to see Salon in an hour's walk and ride, and then meet the through express at Miramas, some six miles away to the south. Starting at once to see the twelfth-century doorway at Saint Michel, we found the Romanesque portal less interesting than the older door at Aix, and then pounded away over the rough stone pavements to visit the northern section and the collegiate church of Saint Laurent. With the exception of the lower stories of the old tower, Saint Laurent dates from the time of Jean de Cordonne, Archbishop of Arles, who in 1344 built the plain church that to-day is the only survivor of several monastic buildings. The place is now famous as the tomb of Michel Nostradamus, the Provençal astrologer, who resided at Salon for years, and gained a reputation for prophecy and learning that made him adviser to Catherine de' Medicis and doctor to Charles IX.

Since this church offered little of special architectural interest, except the fragment of the older building now under the picturesque south tower, we returned to the central part of the town, and, passing the fine old gateway, and clock tower, started along the road to Arles. Fortunately, our route to Miramas turned off to the south, after a few rods of very indifferent riding. The Salon and Arles sections of the Carte de la France show the distance between the cities to be about twenty-four miles, with eleven miles in an



Cloister of Aix Cathedral.

absolutely straight east and west line, that follows the north bank of the Langlade canal across the level plains of the Crau. At the hotel we were assured that the distance could be easily covered in a little over an hour,—a statement we did not attempt to verify; for we were quite content to leave the proof to men with less heavily loaded wheels. With plenty of time ahead, we jogged along a wide level road, passing several omnibuses filled with country people returning from Salon markets. On either side the luxuriant trees and low growths of the marshes were occasionally broken by quiet pools whose shallow depths, joined by numerous canals and ditches, seemed to form a veritable network of waterways.

We expected to visit the ruined château at Miramas, some three kilometers beyond the station, and a little further on to see the triumphal arch of the Flavian bridge at Saint-Chamas; but, as a troublesome pedal caused delays and repairs along the way, we arrived at the modern village of Miramas-Gare only in time to buy tickets to Arles, to pay our ten centimes for bicycles, put our wheels on board, and hurriedly find places in the crowded train. Many times during that ride we congratulated ourselves on the change in plan, even though we had omitted the towns on the southern slope of the Alpilles. Taking saddle again at the Arles station, we passed through the open avenues of the Jardin de la Cavalerie to the towers of the city gates, when we were at once in the narrow, tortuous streets of the mediæval city.

Arles is not known for its late buildings, though, by walking its roughly paved ways, many good sixteenth-century houses are to be found. To the student, and even the casual visitor, the Roman and Romanesque monuments are of far greater interest, for Arles has to-day some of the best

examples of ancient building and sculpture to be found in Europe. Fortunately, several hours of daylight remained after our quarters were secured in the Place du Forum; and we hurried to catch a first glimpse of the famous build-

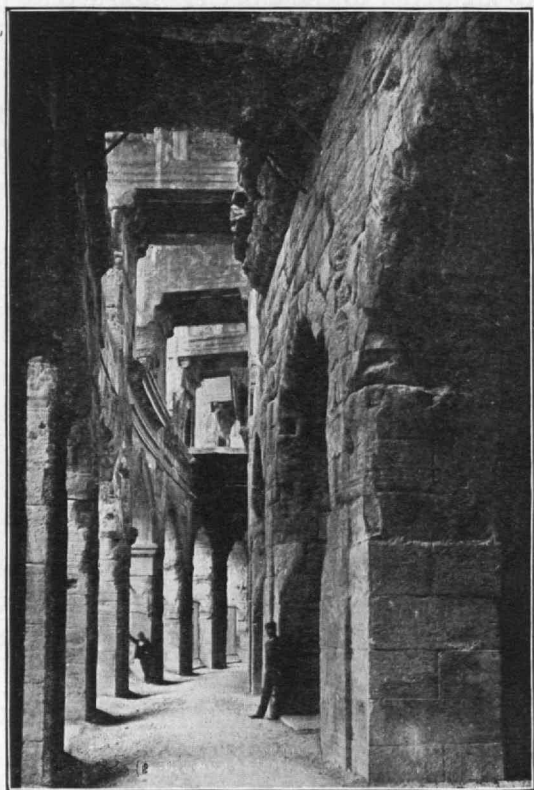


Place du Forum, Arles.

ings we were to study in detail later on. Leaving bags unpacked and wheels uncleaned, we tramped from the hotel, past the unknown fragment of Roman architecture at the head of the Place du Forum. However, as we were to pass that way many times, we did not stop to examine closely its

broken pediment and columns, but continued through the Rue des Arènes to the great amphitheatre.

To-day, as in the days of Augustus and Constantine, this huge Roman ruin is the centre of Arlesian life and interest.



Corridor of the Arena, Arles.

Thanks to the restorations made since 1846, the double-storied outer arches and lower interior seats are now in good condition. Yet the building no longer affords room for the twenty-six thousand people who applauded the conquerors in the old gladiatorial days. The Arena is now used for

less sanguinary entertainments; and the *courses de taureaux*, held almost every Sunday during the summer season, are attended with unabated interest. Large crowds, even, come to see the bloodless, free-for-all sports occasionally offered, when prizes are given to the citizens who succeed in tearing away the barbed rosettes from the shoulders of wild young heifers and bulls.

Not attempting to enter the great enclosure, which we expected to examine thoroughly after the bull-fight of the morrow, we walked along the side of the huge elliptical wall, studied the peculiar construction of its stone arches, and tried to imagine the appearance of the whole, when arches, columns, and mouldings were in their originally complete state. The building was partly destroyed by use as fortress and stronghold by Goths, Saracens, and mediæval warriors. Previous to 1830, also, the interior was filled with houses of the poorest class. Yet the endless arcades, even in ruined form, seem to tell of far greater enterprises and ambitions than those of wild invaders or local chiefs, and by simple dignity alone recall the might and power of imperial Rome.

From the south side of the Arena to the picturesque ruins of the Theatre is only a short distance. We were soon looking into the meagre ruins from the raised ground at the rear of the stage. Evidently, the Theatre was the artistic centre of ancient Arles; for the two columns of African or Carrara marble still standing in place, the carved fragments of the stage walls, as well as the numerous sculptures and decorations now in the Museum, all show details and motives of the best imperial epoch. Here also was found one of the treasures of the Louvre, the famous Venus of Arles. As a whole, the Theatre is now so ruined that it seems hardly possible that some sixteen hundred

people could once be accommodated within its walls; but even in its dismantled state the fragments on the spot and the sculptures of the museums show without possibility of denial that this building was one of the most artistic creations of the Roman emperors. Though surrounded by house-walls that are far from picturesque, it still pos-



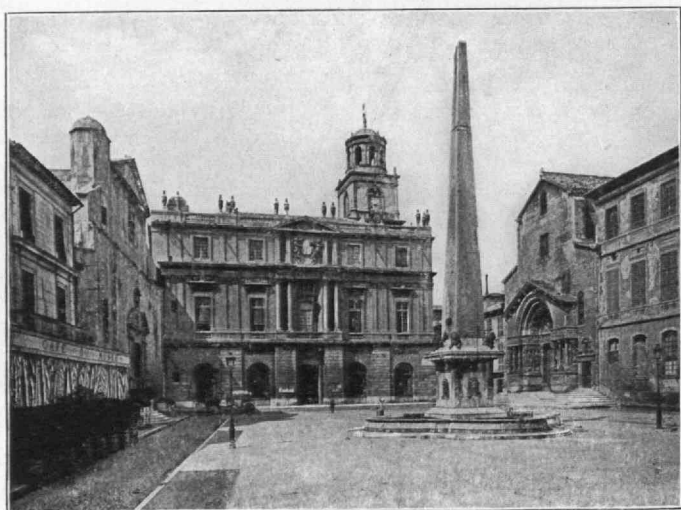
Ruins of the Theatre, Arles.

sesses an air of Greek elegance and refinement seldom seen in Roman work.

From the Theatre we passed through the little crooked Rue du Cloître, showing in its upper part the Gothic entrance to the cloisters of the Cathedral, and then, after passing the walls of the old Bishop's Palace, found ourselves in the Place de la République and before the chef-d'œuvre of French Romanesque sculpture, the porch of Saint Trophime. Provençal tradition has it that Saint Trophime was sent to Arles by Saint Peter himself, and that he built the first church on the site of the Roman prætorium. However that may be, it is known that a portion of the present church was consecrated in the year 606, and that



the portal and part of the cloister were erected in the twelfth century, possibly by the famous crusader Raymond IV., Count of Toulouse and St. Gilles. The porch seems to have been erected shortly after 1152, when the sacred bones of Saint Trophime were removed from the great burial-ground of the Aliscamps and placed in the Cathedral.

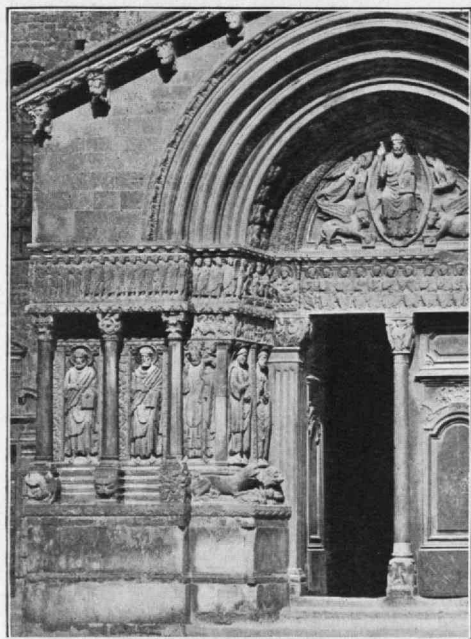


Place de la République, Arles.

The portal is simple in general form, but was intended to express far more than an ordinary stone entrance. Its deep recess, its wide frieze, and sculptured panels, present a picture of the last judgment with a vigor and realism that only firm belief and loving regard could produce. The central figure of Christ seated in judgment, surrounded by the symbols of the four apostles and a double arch of angels, fills the upper part. Immediately below is a broad frieze of figures, portraying the twelve apostles with a group of saints on one side and the punishment of con-



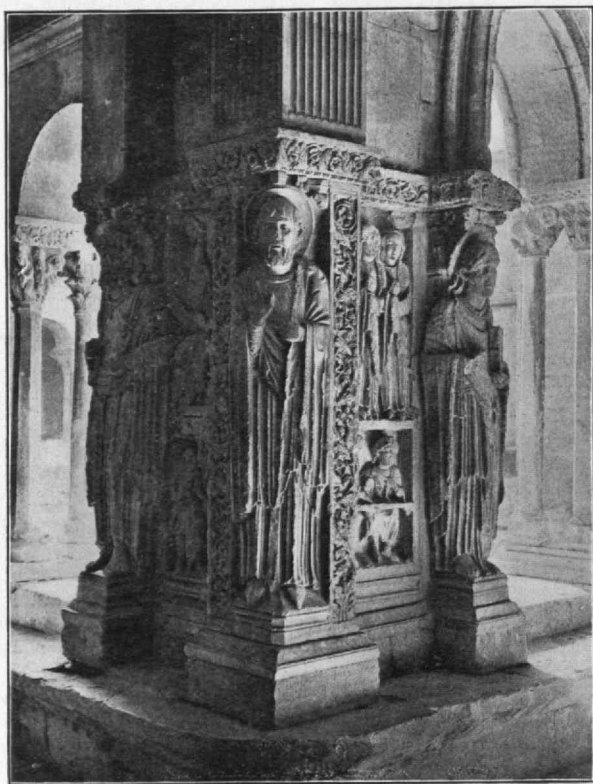
demned sinners on the other. The entire frieze is so designed that rhythmic action and architectural effect are preserved in a remarkable degree. Below are short columns, resting on the backs of grotesque animals; while in the square niches formed between these columns stand



Porch — Saint Trophime, Arles.

large statues of saints, separated and enriched by bands of conventional ornament. The figure of Saint Trophime in bishop's costume is perhaps the most interesting of these large sculptures. The great importance of this decorative composition was evidently appreciated when first designed; for it is raised on a simple basement approached by a broad flight of steps,—an arrangement which gives great dignity to the whole composition.

In the dim recesses of the nave the plain stone vault and walls could hardly be distinguished in the late afternoon light, but we could see that the monastic simplicity of its



Pier in Cloister — Saint Trophime, Arles.

barren spaces was quite in accord with the nave of the old church at Aix which we had visited earlier in the day. Passing through the dark aisles, we climbed a long flight of wide steps, and came at once into the quiet enclosure of the cloisters, famous for their symbolical carvings and picturesque architecture. Here the constructive and decorative arts are happily combined. But the fading light prevented

more than a walk around the vaulted passages and a rapid glance at the bold carvings of the corner piers. So, arranging with the old concierge that we should return the next day to listen to his quaint stories of the saints and heroes under his charge, we stumbled out through the dark church, and, after turning a corner or two, took refuge for the night in our hotel.

And refuge it really was ; for the night before the Fourth, or rather the Fourteenth, had already begun, and only adventurous spirits dared to brave the dynamite crackers and serpents that exploded in unexpected places or chased the daring pedestrian with a fiendishness and velocity that defied resistance or escape. The practical joker was abroad ; and nothing suited better than the filling of an open shop with countless sparks and deafening explosions or the scattering of quiet café groups by means of the erratic serpent. Every man was an enemy for the time being. Shutters were closed, doors barricaded, and only blank walls exposed to the wandering fireworks that shot around the Place du Forum. At last, after venturing out a short way, the risk of burnt clothes and singed hair drove even Americans within doors ; and we retired for the night with visions of the entertainment promised for the morrow — the military parade, the entry of the bulls, the bull-fight, the evening concert, dance on the boulevards, and costumes of *les Arlésiennes* — sadly confused with the towns and buildings we had seen during the day.

Three days spent in sketching and tramping around Arles failed to exhaust its architectural treasures ; and the hours spent in drawing the details of the cloister and the fine fragments in the Museum went quickly by. But, although we visited many interesting sections in our journey up the Rhône valley, across the Cevennes, and down the Loire and Seine to Paris, our first day among the old

Provençal towns was unique, because the unexpected and the unforeseen combined most happily to give us one of the busiest and most instructive days of our summer tour.

ELEAZER B. HOMER, '85.

JANUARY 1, 1900.

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## PRESIDENT CRAFTS TO THE ALUMNI

ANNUAL DINNER, DECEMBER 29, 1899\*

*Mr. President and Gentlemen of the Alumni*,—Large accessions to our funds are a less prominent feature this year, and yet the Treasurer announces a net increase in the property of the Institute of \$437,000. It is true that it was known at our last meeting that the greater part of this sum was coming to us, but I may now speak of a further sum of about \$170,000 which will come to us in the course of this year and which does not appear in the Report.

It is grievous to be obliged to state that \$60,000 was paid to the United States as a succession tax. The constitutionality of the tax has been contested before the Supreme Court, and a decision will soon be given: if it is affirmative, an attempt in favor of institutions like our own and of charities will be made to move the legislature to abolish or diminish the tax. The plea is made that it is not necessary for the support of war expenses, and that it discourages gifts to educational, charitable, and religious organizations.

My Report states that this year has been notable in the

\* An account of the annual meeting and dinner of the Alumni Association, held on December 29, will be given in the April number of the REVIEW. In anticipation of this, we are happy to be able to publish in the REVIEW the admirable address of the President.

educational annals of New England, because of the inauguration of presidents at Amherst, Wellesley, Brown, and Yale. President Hadley in his inaugural address had much to say of the difference in character and spirit between the college and the professional school, taking the military academies of West Point and Annapolis as a type of the professional school. The words used in his description of a homogeneous body of men united by a professional standard apply equally to our own students during their school years; and I think that you, the alumni, will bear me out by your opinions, and still better by your practice, when I go farther and speak of you as united for life by a high standard of professional honor and as marching like a disciplined army to take part in the conquests of civilization.

It is profitable for us who are all of one household, and who have met together to-night to talk freely of the old school-days and to form projects for the future of our Institute, to take up the theme which has been suggested by others, to examine in what way our education differs from that of the college and to see whether new features of collegiate education can be applied to the Institute.

First, you have differed from collegiate students in having made your choice of an occupation at the age of eighteen, instead of leaving it still in doubt, as do so many college graduates, at the age of twenty-two. You have remained steadfast to your early purpose, since nine-tenths of you are still engaged in some scientific pursuit. Most of you are ready to attribute your success in life to the kind of training which you received at the Institute. All this speaks well for our education; but it was not perfect, and now, as you look back upon the four best years of your youth, what would you have changed for the present generation?

This after-dinner time, when we meet once a year, is a moment when such questions can be put freely ; and often, in your visits to your Alma Mater, you are willing to give us answers, and we always value your advice founded on experience.

You will see that what I have to say is chiefly in approval of the present system ; but suggestions have been made for changes in two directions, and it is necessary to give some reasons for our preferences. The suggestions are with reference to greater laxity in the courses of study, and of some movement to stimulate competitive athletics and in general class feeling and the joys of college life.

Within the last thirty-four years, since the foundation of the Institute of Technology, and even before, the professional school has done much to transform collegiate education ; but the most noticeable change in American colleges has been the introduction of electives and athletics, and it is certain that they have greatly contributed to make college life popular. Has the time come to diminish studies, to increase sports, and to introduce these features into the schools of applied science, where the students are of the same age as in the colleges and have similar tastes ?

The wishes of father and son sometimes concur to demand the change ; for many a man of the older generation, and often one of the most successful and best workers of his time, looks back with most satisfaction upon the idle episodes of his college life, and deliberately chooses that his son should pass four happy years, thoughtless of care and careless of thought. He enters the willing youth at some college, where a compromise can be made between his programme and the more serious outlines of the academic prospectus, and where large toleration is exercised in favor of youthful athletes.



The picture would be completely false, were it not added that the opportunities offered to athletic and social tastes are only incidental upon a generous freedom of choice in the amount and kind of studies, and that the chief aim of all our colleges is to make education attractive by offering a varied and abundant feast from the ever-growing tree of knowledge. The number of elective studies has only become so large and so well suited to every mind through the immense effort made by our universities to offer an adequate presentation of all classical learning and of modern art and science; and, so far as possible, a presentation at first hand by original discoverers is provided.

First, as to electives, I believe we are doing what we can when, with stricter conditions regulating a minimum of studies, we allow the attendance of special students; and the range of our studies in science and in art is considerable. Our main business, however, after having asked a student to make an early and definite choice of a profession, is to guide him through a sequence of studies which shall enable us to say in his diploma that he is fitted to take up a certain occupation. With such an object in view, it is agreed upon all sides that the strict direction of professional studies must lie in the hands of the teachers, and that few opportunities can be offered to varying inclinations to make excursions from the line of march. It may be added that the task imposed upon the Faculty is no light one when a programme has to be established for new studies with appropriate sequence and prescribed hours. The difference between our system and the collegiate want of system is most felt when uncongenial studies are interspersed among those of a chosen branch, and certain subjects are taken as bitter doses. Is there, however, any profession, except perhaps the pursuit of art or of pure

science, where a man is not obliged to do what he does not want to do? And is not such compulsory work a fitting training for practical life?

The question can be answered if we examine a mode of instruction carried to its extreme, as was done at the time when the courses leading to honors at Oxford and Cambridge were largely formed to suit the convenience of the examiners, and were in part dry test subjects rather than the elements of a complete education. Yet, when Macaulay was questioned as to the careers of those who stood highest under these tests, he, without preparation, gave the names of all those who had taken highest honors at his university, Cambridge, for all the years from 1800 to 1860, and showed that they had usually distinguished themselves in the most varied careers.

It must be admitted that there is a danger attendant upon our system of careful direction; but it does not appear to be inherent in it, and it might be partly eliminated by efforts on the part of teachers and students. Let me submit this question to your retrospective judgment: Were you not a little too much preoccupied with the desire to fill your four years' course with the most authentic information in largest possible quantity, until you became haunted with a feeling of the shortness of life and the length of art? Did you not get to consider it bad economy to think out certain things for yourselves, when you could find them out by asking a professor?—not in a spirit of laziness, but of avidity for knowledge. Research work developed originality, and the whole training made for self-reliance; but, I fancy, too few of you found time for taking up those unguided speculations which are most educational in the end. Regnault said that his class in mathematics was so strong because it had such a bad professor; and, in con-



sequence, after each lecture the class met together to go over the work by themselves, Regnault being their chairman.

If ever we have a larger number of electives, and I think it will be possible to do so in some courses, they will enter through the door just pointed out to you, and it will be the students themselves who will hold it open. New fields of study can be introduced without too great effort or expense when groups of students learn the art of catching an inspiration from a master, and appropriating it to themselves by reflection and by discussion. A French authority has been quoted in regard to mathematics; and, again, it may be pointed out that the precision of the French mind comes quite as much from such habits of discussion as from methodical training. An example of a maximum of effect with the minimum of professional teaching is to be found in the French studio of painting or architecture, where the master impresses his style and his modes of thought upon his scholars, although he may criticise each one no longer than ten minutes during a weekly or fortnightly visit.

The large numbers gathered here to-night may be taken to mean that the gymnasium project is a subject which this year strongly interests the alumni. The desire to do something important and appropriate in affectionate remembrance of General Walker has led to a well-organized movement among you to be continued for five years, and to result in the collection of funds for a memorial building; and you have just listened to an admirable report from your committee.

Good progress is reported, and now that more than \$20,000 has been collected, or promised, an appeal is made to the government of the school to spend immediately \$75,000 or more to buy and hold land nearer to the Institute

and more expensive than the Garrison Street land, in order that the gymnasium shall be erected upon it five years hence. You are asking the Corporation to take money now devoted to supporting courses of study and to use it for this purpose. Perhaps it may interest you, the alumni, to have me state how this proposition is likely to be received by the Executive Committee of the Corporation. However, I can only speak for myself regarding the last part of the subject, for it has not yet been under discussion by our government. We have had constantly in mind the desire to add all forms of physical exercise to the strenuous mental exercise which is demanded from our students, and we are sure that one will support the other. Even the weariness of hours of standing in a designing-room or laboratory is relieved by gymnastics; and the time consumed by lectures, drawing, and experiment still does not preclude gymnasium work. For these reasons the place for athletic exercises should be made as attractive as possible, and I can assure you that the terms of the report of the Gymnasium Committee meet with hearty approval and that a great effort will be made to comply with their request. The question is an urgent one because we may at any time be deprived of the site of our present gymnasium.

Shall any one seek to combine the movement described in the gymnasium report with another destined to change the policy of the Institute regarding competitive athletics, I will say that I think that our policy can never be the same as that of a college. And, if you would know the reasons, I will give them in the words of one who was devoted to the end of his life with youthful fervor to athletic games, one who has pronounced the most eloquent eulogium upon college sports, and has found nothing but appreciative

words to say of competitive college athletics, and has found everything to say in favor of exercises and games in our own school; and yet, at the end of a Phi Beta Kappa oration, June 29, 1893, he gave the following judgment:—

“But, if we concede that these exercises and contests are to hold their place in American life, is there no stopping-place, no point at which college authorities or the young men themselves, on their own motion, in their own discretion, for their own good, can say, ‘Thus far, and no farther’?”

“I answer, yes: there is such a natural stopping-place. It is at the doors of the professional school. . . .

“In and after the professional school, whether that be a school of law, of medicine, of divinity, or of technology, there should be no representative teams. The principle of competition and championship should be dropped. Individuals should continue at their pleasure to play tennis or cricket or football with their classes, with private clubs, or in town and county matches; or, if teams be formed in such schools, they should not be regarded as carrying the honor of their institutions around with them. Such teams should not expect victory. They should play for exercise and for the fun of the thing, and should accept their inevitable beating with serenity and good nature.”

These words were uttered by the man whose name will be graven over the door of your new gymnasium; and, if it is to be a memorial, let the spirit of these sentences be inscribed in your memories.

General Walker, as you all know, liked a fair fight, and was not wanting in a keen relish of the competitive side of life; but we may well believe that his views were enlarged by the fact that, while still of college age, he was taking his athletic exercise in the muddy roads of Virginia

and on the battlefield, that he took his manful part in the competition between rival armies with the whole world for spectators. And, since such features seem inseparable from athletic struggles, it may be added that all the stock exchanges of the world were betting on the results.

A man who had played that stern game with the honor and integrity of a nation for the prize, and death for the forfeit, may well ask you to lay aside what he calls athleticism when you enter upon the very serious task of preparing for a life's work at a professional school.

In conclusion I wish to express a wish for the future of the Institute. I hope that in years, perhaps far distant, you will witness a change in the direction of our studies and a progress toward those which are generally considered in Europe as belonging to the highest forms of university education. Much that we teach in our universities would be considered by European critics as belonging to preparatory schools. What distinguishes above all things the highest education supported by public funds in European states is the freedom of the position made for the professor. A man who has invented a new science or a new philosophy has a chair created for him. He becomes a pensioner of the state for life, with no onerous obligation to teach, and with the confident assurance that his own way of bringing his knowledge into use will be the best way. Such a man is sure to be a leader of men, although individually he may come into contact with few. The places made for the great masters have also determined in some degree the position of the university professor. Many inferior places are open to men capable of original research, and the state has found by experience that money invested in genius or even in respectable talents brings in quick returns. With few exceptions such places have not yet

been made for our best men in art or science; but, if private citizens or states will found such chairs of research, we have the men ready to fill them. They belong in a school of applied science as well as in the university.

You will see in the future a more diversified composition of the technological institutes. There will be then as now a large body of students seeking to take the shortest road from the high school to the exercise of a scientific profession. The number will increase of older students, who, for pleasure or profit, or for both, have taken a college course before taking professional training, probably many of them spending two or three years at the college and a corresponding time at the school of applied science. We may hope also that around the eminent men of science now at the Institute, and around those who may be added to their numbers in the way that I have described, there may be grouped students of all ages, and even some among them who may retire from business cares for a while, to make a special study of scientific problems. Only by the union of all these forces can our Institute arrive at its highest usefulness in art and science, and offer education fully worthy of this wonderful age.

## EDITORIALS

The recent munificent gift of \$50,000 to the Massachusetts Institute of Technology, by Mr. Augustus Lowell, to serve as the nucleus of an endowment fund for the benefit of its instructing staff, emphasizes a very present problem in collegiate administration. The well-defined idea prevails among the general public that college professors are underpaid as a class, consideration being taken of the character of their service and of the years of unremunerative preparation required for their work. If this be so, the matter of making some provision for them in cases of old age or disability becomes one of simple justice. Columbia University was, perhaps, the first to inaugurate a definite policy of retirement under pension for members of its faculties. It is but two years since Harvard adopted such a system. Cornell University has for some time held a similar project under advisement.

It will thus be seen that the problem presented is of more than local significance. Most of our universities and colleges, it would seem, are now adequately equipped with scholarship funds. There is little expectation that any earnest and deserving young man will fail to secure substantial aid in the attainment of a college education. President Hadley, in his notable inaugural address at Yale, wisely directed attention to this fact. Private benefaction has generously provided for this result. For example, at the Massachusetts Institute of Technology there are now funds yielding an annual income of \$24,000 for the specific aid of worthy students. The problem of the future is not to make provision for the needs of the students, but for the instructors.

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It is curious to compare the American situation in this respect with that of the great English universities. They in the past have cared far more liberally for the instructor than for the student. The comfortable livings for their fellows were oftentimes quite out

of proportion to the direct service rendered in instruction, however much they may have been earned in the lines of literary or theological research or production. Recent tendencies seem to be quite away from this mediæval practice. A great decrease in the income from tithes or endowment applicable to salaries or livings has been nevertheless accompanied by a notable expansion of the expenditure for scholarship aids. Oxford University thus increased its expenditures for student aid by about \$20,000 in the decade from 1883, while its income available for salaries and current expenses lessened by upwards of \$50,000 in the same period. In the United States our experience has been quite the opposite. Here in America the first care has been for the student, both by direct gift from private individuals or by State endowments. Donors have expressly stipulated that their gifts should be devoted either to the erection of buildings or to scholarship funds, with the result that the salary lists have been exclusively covered from current income.

It should be borne in mind, moreover,—a fact which is not usually appreciated by those who make gifts to colleges for aid to students,—that each scholarship thus endowed or established often entails a real drain upon the fiscal resources of the institution. For example, the cost per year of each student at the Institute of Technology is approximately \$340. The tuition fee is \$200. Each scholarship student thus entails a deficit below expenses of \$140.

Thus it appears that the very generosity of donors for aid of students often operates to reduce the amount available as compensation to the instructing staff. All of which makes it clear that Mr. Lowell, than whom, as senior member of the Executive Committee of its Corporation, none could be more fully informed of the circumstances, has wisely as well as most generously drawn attention to an urgent need, not alone of the Institute of Technology, but of the colleges and universities of the country as a whole.

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A mother of many is reported to have said that no child is interesting until it is three years old. With about the same half-



truth, this might be said of periodicals. The child and the magazine have equally to be shaken into place in the economy of things. However anxious and unpleasant to the mother and to the editors may be the task of shaking, the world takes little interest in the process, judging the infant and the periodical solely by results. The first year of the TECHNOLOGY REVIEW has moulded it into rough promise of what it ought to be, the second should put shape to it, the third some manner of finish, so that at about the age when the average child becomes something else than a nuisance to an unsympathetic world the REVIEW ought also to have arrived at that degree of finality and maturity which shall assure its permanence in the economy of the Massachusetts Institute of Technology.

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Meanwhile, however, the REVIEW must be kept alive; and the chief danger to its existence lies in the fact, not that it requires so much, but that it needs so little. There are thousands of Institute men who take at least a dollar's worth of interest in it, and who would be glad, annually, to contribute that sum to its support, especially as that contribution brings to them, in the four handsome numbers, a reward far greater than that with which virtue must ordinarily content itself. These men would be sorry, indeed, to see the periodical expire; but the dollar is so small a sum, it seems so easy to send it at some other time than the present, it is so difficult to decide in what form to send it, that in far too many cases the man who would like to receive the REVIEW does not get it; the REVIEW, which needs his dollar, does not get that: and both suffer thereby wholly needless damage. The main problem, then, of this as of every other periodical, is to establish financial communication between itself and those who would gladly be subscribers to it, could their inertia once be overcome. Barnum, a competent observer of mankind, is said to have declared that, if every fool in the country would pay a quarter at the door of his tents, he would become fabulously rich. *Per contra*, if all the wise Institute men, who really want the REVIEW, would remember to

send a dollar to it, the financial future of that publication would be wholly beyond peradventure. Upon such small deeds does fate hang.

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The only known way of establishing such communication is by means of the printed circular or of that obvious fraud, the duplicated personal letter. That being the case, every man of affairs sits, like Cyrano under the falling leaves, in a ceaseless shower of advertising leaflets. To make any impression, a circular must, as the French say, "leap to the eyes." Hence the straining after sensations, the success of the advertising specialist, the phenomenal vogue of that thing, be it good or bad, which has found some new and striking way of making itself seen above the unheeded mass of ordinary wares. But, such means being equally beyond the resources and below the dignity of the REVIEW, it must await the loyalty and zeal of those Institute men who will take the trouble needed, not only to renew their own subscriptions, but to bring the REVIEW before those who ought to be, but who have not yet become subscribers to it. The future of the enterprise lies in their hands.

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This question of making one's existence known, or, more bluntly, of advertising, is a curious one as it relates to colleges. Obviously, no such institution may put a broadside in the newspapers or cover the bill-boards with lithographed advertisements. On the other hand, shall a college refrain wholly from making itself known, except through the slow and uncertain channels of its graduates? It may be argued that, since no reputable college is a money-making institution, it has no need to follow in the footsteps of those enterprises which seek pecuniary success. The obvious answer to this is that, while the college may not seek money directly, that commodity is absolutely essential to it, and can be secured only by making the work of the institution not only so successful, but also so well known, as to bring to it either liberal private endowments or the aid of the State or city. A good collegiate

training, especially under modern conditions, costs far more than any one is willing to pay for it. The difference between what the student can and will pay and what his education costs must be made up through public or private charity; and an important business of a college is not only to deserve, but to attract, for the sake of the young persons whom it would train, that charity.

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Just at present the residential colleges, where dormitory life permits of a high degree of organization and concentration in sports, find themselves — quite without conscious effort on their part — attracting ample notice through the popular passion for athletic games. The leading contests among these colleges seem, sometimes, to outweigh matters of world-wide moment; and the newspapers, prompt to meet the cravings of the public, fill their daily pages with the minutest details of college and preparatory-school athletics. As, in most instances, the boy himself — however fondly his parents may imagine otherwise — chooses his college, and as to most boys these minutiae of college sport are of absorbing interest, it is plain that this extended notice, brought about, not by the colleges themselves, but by a public demand, has had not a little effect upon the growth of those educational institutions in which athletic sports receive marked attention.

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Quite apart from this matter of attracting popular attention, athletics are valuable to a college from two points of view: they promote college loyalty, which, intangible and often foolish in its manifestations, is, nevertheless, a most necessary cement in the upbuilding of any such institution; and they stimulate among the whole body of youth an interest in gymnastic training. These, it is almost superfluous to say, are ends actively to be sought. The old idea of a college — and here one must distinguish it carefully from a university — as a place for training scholars has given way to the right conception of it as a place for building men. And a man not built as fully and judiciously upon his bodily as upon his intellectual side is but a deformed or unformed creature, handicapped in

whatever he may undertake. This being so, the modern college is bound for its own sake, for the sake of right education, to provide for, to encourage, and even to demand obedience on the part of its students to the now well-understood laws of hygiene in general and of physical exercise in particular.

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Such provision and encouragement, however, is expensive, more costly than most colleges can afford. Fortunately, it is exactly at this point that the college can most justly claim the direct aid of its sons. It is just in this matter of physical training that the past student and the present can be brought most closely together. No man can take part in the struggle for subsistence, none can taste of the higher things of life, without at once realizing the enormous advantage of physical health and strength. None better than the graduate can appreciate the needs, on the bodily side, of the undergraduates. Therefore it is that the Walker Memorial Gymnasium has been undertaken. And on the day when that gymnasium is opened there will have been added to the splendid courses of the Institute of Technology a new one, open to all students alike and not less valuable than any other department of scientific study,—a course truly technological, for it will consist of the application of the sciences of physiology and hygiene to the art (the most important of all arts) of healthy living. Whatever money comes to the Institute for other special purposes—for scholarships or for the establishment of courses or professorships—can in the nature of things be of direct benefit to but a small proportion of the students; whatever may go to the building of the proposed gymnasium will benefit every student in the college, throughout his course and throughout his life. Moreover, it will raise the efficiency of the Institute, through the increased physical and mental power of its undergraduates and graduates, more than any of us can now realize. Finally, as a gift for all time from the older men, who are reaping the benefits of the Technology training, to that ever-flowing stream of younger men who are coming under its quickening influences, this Memorial Gymnasium will make for such solidarity and loyalty among Institute men as has not yet been reached.

## GENERAL INSTITUTE NEWS

Readers of the REVIEW will have seen with genuine regret the recent announcement of the resignation of President Crafts, communicated in the following letters : —

MASSACHUSETTS INSTITUTE OF TECHNOLOGY,  
BOSTON, Jan. 1, 1900.

The Executive Committee of the Massachusetts Institute of Technology have to announce to the members of the Corporation the resignation of President Crafts, to take effect at the end of the present school year.

The Executive Committee have found it impossible to induce President Crafts to reconsider his decision, and have accepted his resignation with great regret.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY,  
BOSTON, Oct. 24, 1899.

TO THE EXECUTIVE COMMITTEE OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY :

*Gentlemen,*—I wish to communicate to you my desire to resign the office of President at the expiration of the school year of 1899–1900; and I write at present, in order that you may have due opportunity to consider the choice of a successor.

My reasons for taking this step at this time are founded upon my desire to return to purely scientific occupations. My term in office has shown me the wide field of educational problems, both within and outside the Institute, which should be studied; and I have found that such studies and the performance of administrative duties, although not in themselves burdensome, leave little freedom for the pursuit of experimental science. A choice must be made between administrative and scientific occupations, and it is the latter which I wish to choose.

The office with which you have honored me, perhaps in consequence of my long connection with and interest in the school, has brought me into more intimate relations with the government of this great Institute, with its instructing staff, and with many of its students; and I look with great pleasure to these few years of educational work, and particularly to my participation in the deliberations of the Executive Committee, which have led to close and friendly relations with its members.

All these ties are severed with great reluctance, to return to a field which aroused my early enthusiasm, and which still claims my most active interest.

Yours respectfully,

J. M. CRAFTS.

President Crafts was Professor of Chemistry at the Institute from 1870 to 1875, returning in 1892 to become again Professor of Organic Chemistry. He had thus an intimate knowledge of the early history of the school and a close acquaintance with the work of President Rogers and his associates. On the sudden death of President Walker, in the early days of 1897, the thoughts of the Faculty and the Corporation turned at once, therefore, to Professor Crafts for leadership in time of need. The duties of the chairmanship of the Faculty were assumed by him, although not without much reluctance, long occupation with independent research having made Professor Crafts hesitate to undertake administrative routine. The remainder of that year and the opening of the next passed most successfully, and in October the Corporation unanimously elected Professor Crafts President of the Institute. The two years which have intervened since that time have been eventful, and with all the progress of the school the President has been actively identified. Notable additions have been made to the Institute buildings. President Walker had been much disappointed that plans for the new building had not been put in execution on account of limited funds, but unexpectedly large receipts from the estate of Mr. Henry L. Pierce so increased the resources of the Corporation that the delay proved fortunate in making larger and better buildings possible. At the same time important changes were carried out in all the older buildings, every department of the school gaining relief from previous crowding.

Through the efforts of the President and his associates in presenting the needs of the Institute to the John W. and Belinda Randall Charities Corporation, there has been received from the Randall trustees the gift of \$75,000 for the general purposes of the college. In addition, the Institute has been the recipient, during President Crafts's administration, of an unusual number of gifts and bequests,

among them those of Mr. Edward Austin, Mrs. Julia B. H. James, Mr. George A. Gardner, and Mr. Augustus Lowell. It must be a source of peculiar gratification to the President that, through the generosity of Mr. Lowell, there should have been established during his term of office, in such liberal proportions, the beginning of a fund for the benefit of the teaching staff.

The number of changes in the Faculty during his administration has, fortunately, been small, the only death being that of Professor van Daell. Important questions in regard to instruction have, however, required his earnest consideration. The President's report of last year included a statement of negotiations with the authorities of the United States Navy Department in regard to the education of graduates of the Annapolis Naval Academy in naval architecture. Up to the present time these negotiations have not led to a positive result. Among important changes announced this year are included the introduction of the option in heating and ventilation into the course in mechanical engineering, and of landscape architecture as a part of the course in architecture.

While his duties as professor of organic chemistry did not involve contact with large numbers of the students of the earlier years, and the great size of the more recent classes has forbidden personal acquaintance with many of their members, President Crafts has welcomed opportunities to meet Institute men, individually and collectively. Those who have been fortunate enough to be present at the gatherings of the alumni will long remember the delightful combination in his addresses of a rare and fine humor with scientific breadth, deep interest in education, and high ideals for the future of the Institute. In the success of the two more recent alumni undertakings, the TECHNOLOGY REVIEW and the Walker Memorial Gymnasium, President Crafts has taken active and effective interest.

It is a matter of deep regret to Institute men that the President's love of scientific research has proved superior to that for administration, for which his professional reputation, his courteousness, his knowledge of affairs, and his educational experience are such valuable qualifications.



## AN ABSTRACT OF THE PRESIDENT'S REPORT

The annual report of the President and Treasurer of the Institute is now in press.

President Crafts opens his report with a reference to recent notable events in the college world. The inauguration of presidents at Amherst, Wellesley, Brown, and Yale, the announcement of educational programmes at those occasions, and in particular a comparison made by President Hadley between professional schools and colleges, have led to a statement in the President's report of the part which is taken by the Institute in the educational efforts of the day.

The President of Yale describes the students of military academies as a homogeneous body of men pursuing a common scheme of studies, with a common end in view, and with rigorous requirements as to work, and says that in colleges the community of interest is less, and the community of hard work is very much less; and he fears that the true spirit of college democracy may pass away under the new form of college life.

It is pointed out in the report that an independent school of applied science also attracts a homogeneous body of students, because selection is brought about by the known fact that this course of study is arduous and demands a mind trained to mathematical discipline, thus operating a selection before entrance; while a prescribed curriculum and a mature understanding of the application of the studies to professional work lead the students to strive constantly toward a common goal.

"*Esprit de corps* in college is succeeded in after-life by the professional spirit with its declared standard of honor and distinctness of purpose, so that in the civil as well as in the military professions men are bound together, and form a disciplined element in the community.

"The subsequent careers of our graduates prove the maintenance of professional spirit, since more than 90 per cent. remain in some sort of scientific occupation. They form part of an army of more than 30,000 engineers, chemists, miners, physicists, and architects,

who are transforming American industries and replacing wasteful guess-work methods by calculations and by trained taste."

The difference between educational work of scientific schools and colleges is described as follows: "Any institution whose fixed course of studies maintains a high educational standard and strengthens a distinct purpose till it is settled for life is doing its true work as a professional school. The college of to-day seems to be accepting another task as its most important function,—that of directing and giving play to scholarly and social tastes."

Attention is called to the tendency which is growing in all professional schools to make their work succeed that of college; and it is stated that in Germany, now that the polytechnic school of Charlottenburg has acquired the right to give the degree of Ph.D., projects are on foot for establishing a technical degree superior to that of the university.

The fitting place for technical schools, whether independent or incorporated with a university, is discussed; and it is noticed that in Europe they are almost always independent, while with us they have usually grown up under the shelter of an old university or as part of a new one. The advantages of independence in handling problems so different from those of the university is pointed out; and we think that it has been illustrated by the history of the Institute, which has had a free development within a great educational centre.

The methods of teaching applied science thus organized have in some branches been more nearly in touch with the demands of the time than in any other country. The report says: "Such governing bodies, unlike ministers of education abroad, have frequently been obliged, not only to decide upon new courses of study, but also to pay for them from their own pockets; and in the Institute each demand has met with a generous response, not only from those of our own government and from our alumni, but also in a very remarkable way from men quite unconnected with us, who have put their wealth in our hands for distribution without reserve or restriction. It is easy to understand that the expenditure of funds

under these conditions should be made with the shrewdness of the best business methods, and economy of production is one of the most notable features of American institutions of higher education, and is sometimes in strong contrast with those of Europe. Former reports have alluded to the attention which American methods of education in science have attracted in Europe; and again this year we have received visits and requests for information from persons charged with the establishment of schools of applied science in England, in Germany, and in Russia."

An account is given of the course of study leading to the degree of Bachelor of Science, and it is held to be at least as broad a programme and more faithfully followed than that leading to the degree in arts under the elective system.

The classical tradition that a council of teachers can provide the best course of studies for a professional career has been adhered to in our scientific schools; and it is said that colleges have now assumed a different task, that of providing with large freedom of choice for scholarly and social tastes. Some of the results of the new collegiate methods are questioned, and it is said that "the choice now made by students under the elective system shows a singular neglect of mathematics, and in particular of physical studies which underlie the greatest achievements of this scientific age."

The considerable accessions to our funds during the last three years have been used to introduce necessary improvements in our courses of instruction; while the claims of students unable to pay our high tuition fee have been met by an increase of about 50 per cent. in the scholarship appropriations, so that they are now \$24,000. It has not been thought expedient to reduce the tuition fee, but rather to make the education more valuable. Undoubtedly, the small increase in the number of students, 1,178,—only 8 more than last year,—is affected by the growth of flourishing schools of science with very low tuition fee, in some institutions \$15 to \$30.

The office of librarian was established ten years ago, and Dr. Bigelow reports the progress made since that time. The library

has grown from 17,545 volumes in 1889 to 50,149 volumes. An excellent room for the general library has been provided, and is much used between hours of lectures. We were among the first to divide our books among the departments for more convenient use, and some of our departmental libraries stand among the first in the world. According to the lists in *Minerva*, we come fifth in numbers of books among the European technical libraries. The value of our libraries is estimated at \$112,866. This year 3,438 volumes have been added.

At the solicitation of the United States Commissioners, and also of the Massachusetts State Board, we have sent an exhibit to Paris. Many new photographs have been taken, which, together with engineering and architectural drawings and explanatory texts, will give a good presentation of the work of the school, and form a permanent record of our standing in 1900.

A new option in Landscape Architecture has been planned to diverge from the architectural course in the second year. A principal feature is a course of studies in Horticulture, extending through three years. The position of the Institute offers unrivalled opportunities for these studies; for we are within easy reach of the Arnold Arboretum, which, under the direction of Mr. Charles S. Sargent, has become known throughout the world for its tree and plant culture. The lectures on Landscape Architecture will be given by Mr. Guy Lowell, 1894, who has recently received the diploma of the *École des Beaux Arts*, and who has made a special study of the subject in Europe.

An option in Heating and Ventilation has been added to the Mechanical Engineering Department in consequence of a recognized demand for this special work. It will be under the charge of Professor Woodbridge, whose thorough theoretical knowledge and large practice have given him the best preparation for this work.

Few changes are reported from the different departments. The Mathematical Library has been named the Runkle Library; and it is now enriched with the gift of President Runkle's private library of 450 volumes upon mathematics and astronomy, besides pamphlets.

Professor Burton is to take charge of an expedition to Georgia, to observe the total eclipse of the sun of May 28. New arrangements and enlarged quarters have enabled the Mining Department to deal successfully with the greatly increased number of students in the classes. The Summer School of Architecture under Professor Homer visited Italy and France.

Some imperfections in the ventilation of the new third year laboratories in the Walker Building have been remedied by use of an electric fan. Dr. Thorp, thanks to a fund provided by Mr. Samuel Cabot, was enabled to make a tour of inspection this summer, visiting the most important chemical works of England, France, and Germany.

The Physical Laboratories have acquired several important pieces of apparatus, and the enlarged space allotted to Heat Measurements has allowed of much improvement in the instruction.

The Biological and Geological Departments, removed last year to the Henry L. Pierce Building, report greater facilities for work in larger quarters.

Professor Sumner has given a new option in the Politics of Eastern Asia, which touches on questions regarding our colonial possessions.

#### CORPORATION NOTES

The 278th meeting of the Corporation was held October 4. Dr. Francis H. Williams was re-elected Secretary, and Colonel T. L. Livermore member of the Executive Committee for five years. Mr. John E. Hudson, a new member of the Corporation, was added to the Visiting Committee on Physics and Electrical Engineering. A memorial of Mr. Samuel Johnson was presented.

The 279th meeting was held December 13. The time was occupied largely with the presentation of the annual reports of the President and the Treasurer. An abstract of the President's report will be found elsewhere in this number. The Treasurer's report enumerates the gifts received during the year, most of which have already been noted in the present and previous numbers of the

REVIEW. It is shown that, while the income of investments for general purposes has been increased by more than \$11,000, this has been nearly offset by advances of salary, the final result being an adverse balance of more than \$19,000. On the other hand, there has been a nearly equal gain on securities sold. The property of the Institute has been increased during the year by more than \$437,000, of which only a fraction, however, is available for general purposes.

#### THE INSTRUCTING STAFF

Besides appointments announced in the October number, the following changes have been made: Lieutenant James Hamilton has been detailed by the War Department, and appointed Assistant Professor of Military Science. Lieutenant Hamilton graduated from the U.S. Military Academy at West Point in 1890, and has recently resigned from military service and taken up the practice of law in Boston.

Messrs. Edward M. Bragg, Frederick L. Edmands, George M. Holman, Elbridge C. Jacobs, Areli H. Jacoby, Carleton S. Koch, Lewis J. Seidensticker, Percy G. Stiles, and Robert G. Valentine, Assistants of last year, have terminated their connection with the Institute.

Mr. Jacobs has been appointed Instructor in Chemistry and Mineralogy at the University of Vermont. Mr. Stiles is pursuing advanced studies at Johns Hopkins University. Mr. Seidensticker has gone to a sugar plantation near Cienfuegos, Cuba; and the others have engaged in various lines of professional work. To fill these and other vacancies, the following additional Assistants have been appointed: Charles W. Berry, '95, in Mechanical Engineering; Fred E. Busby, '97, in Industrial Chemistry; W. D. Coolidge, '96, in Physics; Harrison W. Hayward, '95, in Mechanical Engineering; William S. Newell, '99, in Mechanical Engineering; George H. Priest, '99, in Oil and Gas Analysis; George H. Riker, '99, in Mechanical Drawing; Norman E. Seavey, '99, in Physics; Frank R. Swift, '99, in Mechanical Engineering; Charles-Edward A. Winslow, '99, in Biology. Mr. William

Skarstrom has been appointed Instructor in Gymnastics in place of H. J. Boos, resigned.

#### TEACHERS AND LECTURERS FOR THE YEAR

Messrs. Edward P. North, A. H. Sabin, F. G. Stantial, and C. Howard Walker do not continue their lectures the present year. New appointments are as follows: Gary N. Calkins, Ph.D., on protozoa inhabiting water supplies; Charles M. Green, on electric arc lighting; F. M. Green, U.S.N., on longitude determinations; Simeon C. Keith, Jr., S.B., on bacteriology of milk products; Walter H. Kilham, S.B., on history of ornament; Guy Lowell, A.B., S.B., graduate École des Beaux Arts, on landscape gardening; H. G. Prout, on the future of the railroad engineer; Theodore H. Skinner, S.B., on architectural design; George W. Tillson, S.B., on the construction of city pavements; Albert L. Webster, on the drainage of high office buildings; Jasper Whiting, S.B., on cement manufacture; S. W. Wilder, Jr., S.B., on alumina and alumina compounds; Joseph Willard, LL.B., on business law.

#### PROFESSOR LUQUIENS

The following memorial of Professor Luquiens was adopted by the Faculty November 1:—

Coming to the Institute in 1874, he brought to the service of the Department of Modern Languages the energies of a most able, faithful, and conscientious teacher and of a ripe scholar in a field much more extensive than that of modern languages alone. Besides the valuable work done by him in the modern languages and literature, he had already received the degree of Ph.D. from Yale University, especially for work in Sanskrit, and had made researches and published papers on the Sanskrit and Persian languages and literature, which were recognized by those versed in the Oriental languages as valuable contributions to the study of ancient Persian literature. He was connected with the Department of Modern Languages of the Institute, successively, in the capacity of Instructor, Assistant Professor, Associate Professor, and Professor, until 1892, when he left to assume the Professorship of Modern Languages, and subsequently that of the Romance Languages and Literatures, at Yale University.



His superb scholarship, his special adaptation to explain a literature, his great ability, industry, and conscientiousness as a teacher, and his sterling qualities as a man commanded the universal respect and affectionate regard of his students and of his colleagues. It is, therefore,

*Resolved*, That in the death of Professor Luquiens we recognize the loss to the community of a most distinguished and able scholar, of a most successful teacher, and of a man of sterling qualities, who was held by us in the highest esteem.

*Resolved*, That, much as we deplore his death, we feel grateful for the fact that the influence of his writings, of his teaching, and of his life, will survive in the lives of his numerous pupils and friends.

*Resolved*, That we extend our deepest sympathy to his bereaved family.

*Voted*, That these resolutions be spread upon our records, and that a copy of them be sent to Mrs. Luquiens.

#### PARIS EXPOSITION

An appropriation has been made for an Institute exhibit at the Paris Exposition. The United States Commissioners have assigned different educational departments to one or two institutions each. The Institute shares with Cornell University the important and honorable responsibility of representing education in engineering and architecture. The space available would not in any case admit of adequate treatment of all departments, but our work in these lines will be presented with some degree of completeness. For this purpose we are assigned three wing frames and excellent wall space for architectural designs. Portfolios combining text and photographs, as well as portfolios of drawings, will be prepared on the same general plan as those used at Chicago. Besides the usual Institute publications, there will be small guides to the exhibit in French and in English. Professor Burton is preparing, with the head of the architectural department, a plan showing the location of Institute buildings, and of other important public buildings in this vicinity. The photographic work is under the direction of Professor Lawrence, and the large number of existing negatives will be considerably increased to show recent progress. It is hoped that the number of Institute men in Paris may lead, in connection with

the Exposition, to some sort of informal organization for mutual advantage, with pleasant possibilities for Institute men visiting the city during the Exposition or later.

#### CHARTS FOR THE PARIS EXPOSITION

The Economic Department has a force of draughtsmen engaged in preparing charts for the Paris Exposition, to be shown in connection with the educational exhibit of the United States. Some of the draughtsmen have been at work since the first of the summer. One series consists of twenty charts that are being prepared for the department of social economics of the United States. These are prepared from data furnished by the United States Bureau of Education, and will represent facts concerning the age and sex of the school population, and the numbers of teachers and students in the different classes of the colleges and professional schools throughout the country. These charts will hang over the educational exhibit.

Dr. Dewey has under his supervision also the preparation of another series of about one hundred charts for the Massachusetts Commission having in charge the State exhibit. These charts present facts concerning the statistics of the State Board of Health, the various charitable institutions and savings-banks, and the different economic institutions of the State. The charts will be hung in frames, together with mounted photographs of each institution. The series will be turned over to Mr. Walter S. Allen (M. I. T. '79) of the Massachusetts Commission on the Paris Exposition.

#### SCHOLARSHIPS

The munificent bequest of Mr. Edward Austin has enabled the Institute not only to enlarge the opportunities open to its own teachers and graduates for advanced study at the Institute or elsewhere, but has this year placed it in a position to provide for a larger number of applicants than ever before. The total amount of awards for the present year is not less than \$23,200. This amount is distributed among 175 applicants, making an average

of about \$130 each. It is probable that, as time passes, there will be more and more opportunities for applying the income of this fund to the aid of advanced students; and it seems unnecessary that the amount now available for undergraduate scholarships should be materially increased for the present number of students.

#### LOCATION OF THE INSTITUTE

In view of imaginative newspaper statements, it will be of interest to Institute men to learn that the question of removal from the present excellent location is not under consideration by the Corporation. It is desirable to increase the land now available for building purposes, but any removal to a suburban site is only a remote contingency of the future.

#### STATISTICS

The total registration for the present year is 1,178, continuing the remarkable state of equilibrium between gains and losses of students since 1893. During this period of seven years the extremes of registration have been 1,157 and 1,198. Even within the several classes and courses the constancy is almost as complete. The total numbers by courses of regular students above the first year indicate still a slight drift upward in Mining Engineering and Naval Architecture, downward in Architecture and Electrical Engineering. The number of students from foreign countries the present year is twenty-six. Last year it was twenty-seven. European countries included in the list are Denmark, England, France, Germany, Russia, and Turkey. The number of graduates of other colleges is notably increased from sixty-eight to eighty-one, including seventeen from Harvard. The number of women students is fifty-three, in comparison with forty-seven last year and sixty-nine the year before. In connection with the table of graduates it is interesting to notice that accessions to the class of '98 have now brought its membership up to two hundred, which is likely to remain a high-water mark for some time to come.

## STUDENTS FROM OTHER COLLEGES

Every year at the Massachusetts Institute of Technology a considerable portion of the students entering is made up of those who have graduated from or have studied at colleges or universities. These students are usually prepared to begin immediately upon the professional work of the course which they choose.

This year there are in all fifty-two such students, of whom thirteen are from Harvard. Nine are graduates of Harvard, five of Brown, three of Yale, and two of Amherst; while the following institutions are represented on the list of students by a single graduate each: California, Columbia, Cornell, McGill, Maine, Michigan, Minnesota, North Carolina, Princeton, Rochester, Southern Presbyterian, and Vermont Universities, Acadia, Beloit, Bowdoin, Colorado, Dartmouth, Lafayette, Robert (of Constantinople), Randolph, Macon, and St. Joseph's Colleges, Worcester Polytechnic Institute, and the Académie de Neufchâtel.

A group of eleven of these students has entered the course in electrical engineering, the next largest, a group of nine, that in chemistry, while the courses in civil, mechanical, and mining engineering, have each been chosen by six college students. A considerable proportion have entered the courses of architecture and sanitary engineering.

## GYMNASIUM FOR WOMEN STUDENTS

The latest of the many recent additions to the Massachusetts Institute of Technology is a new and complete gymnasium for the use of the women students. For several years the men have been provided for in the line of physical training and instruction at the gymnasium on Exeter Street; and plans are now in progress for the erection of the Walker Memorial Gymnasium, to supersede this old one. The opening of the women's gymnasium, however, is the first step that has ever been taken at the Institute toward providing for the physical culture of women students.

When the arrangement of rooms in the recently erected Pierce

Building was before the Faculty, it was decided to set aside a room to be used for gymnasium purposes by the women; but no such idea as the establishment of a regular gymnasium was thought of at that time. Last year, by the will of the late Miss Marion Hovey, the Institute received substantial aid for the purpose; and it was decided to have the gymnasium fitted up for the use at the beginning of the present college year. Owing to the delay occasioned by the construction of some of the necessary apparatus, which did not arrive until last week, it was found impracticable to open the gymnasium until November. The new gymnasium is located on the first floor of the Pierce Building, and opens from the Margaret Cheney Room, an attractive room reserved for the use of the women students. The gymnasium is of modest, unassuming proportions, and is supplied with apparatus in reasonable abundance, which is carefully and methodically arranged so as to prevent overcrowding and yet leave plenty of room for free exercising and class work.

#### THE SOCIETY OF ARTS

The Society of Arts has read at its regular meetings, held this season, the following papers: "Some Practical Applications of the Storage Battery," by Mr. J. L. Woodbridge; "Visual Signals," by Mr. H. C. Spaulding; "Use of Kites to obtain Meteorological Data," by Mr. A. Lawrence Rotch, Director Blue Hill Observatory; "New Cellulose Industries," by Mr. A. D. Little; "The Character and Extent of Food and Drug Adulteration in Massachusetts and the System of Inspection of the State Board of Health," by Mr. Albert E. Leach, Analyst.

At the fifth meeting the society met in the Henry L. Pierce Building, and was told about the collections made by the Geological Department of the Institute, with the Commissioners of Massachusetts and the United States, for the Paris Exposition. Remarks were made by Professor Niles, Professor Crosby, and Mr. Fuller. After viewing the collections which were on exhibition, the members present were invited by the department to light refreshments served in the Margaret Cheney Rooms.

## THE UNDERGRADUATES

## CLASS OFFICERS.

The Senior, Junior, and Freshman classes have elected officers as follows :—

*Senior Class.*—C. M. Leonard, of Chicago, president ; W. A. Dorey, of Cincinnati, first vice-president ; F. D. Chase, of Chicago, second vice-president ; S. C. Sears, of Winthrop, secretary ; J. H. Bacheller, of Charlestown, treasurer ; G. E. Russell, of Woburn, director ; R. H. Clary, of Seattle, Wash., H. D. Jouett, of Somerville, Institute Committee.

*Junior Class.*—V. F. Holmes, Copenhagen, Denmark, president ; Ray Murray, London, England, first vice-president ; E. Seaver, Jr., Roxbury, second vice-president ; F. W. Puckey, Wilkesbarre, Pa., secretary ; A. W. Rowe, Gloucester, treasurer. Executive Committee : W. W. Walcott, of Natick ; O. H. Perry, of Lowell. Institute Committee : E. G. Thatcher, Middletown, Conn. ; W. Whipple.

*Freshman Class.*—R. M. Field, of Brooklyn, president ; L. H. Lee, of Buffalo, first vice-president ; J. T. Cheney, of Kenilworth, Ill., second vice-president ; E. W. Howell, of Boston, secretary ; C. J. McIntosh, of Racine, Wis., treasurer ; H. T. Winchester, of Dorchester, Board of Directors ; F. G. Babcock, of Tolland, Conn., Institute Committee.

## THE WALKER CLUB.

The Walker Club has organized, with H. H. Howe, of Boston, W. W. Dow, of Malden, R. B. Lowe, and Professor C. F. A. Currier as Executive Committee ; J. S. Bronson, of Nashville, Tenn., secretary and treasurer. W. W. Dow was elected manager of the play to be produced in Junior week. The committee on the selection of the play consists of Professor Arlo Bates, J. P. Draper, of Canton, E. H. Davis, of Hyde Park.

The Club has recently hung a large, richly framed photograph of General Walker in the political science library. This was done by private subscription among the club members and as a tribute to the memory of General Walker. The meetings this year have been unusually interesting. Mr. James P. Munroe and Professor Peabody have addressed the Club, and have contributed much to the knowledge of the Club by very instructive and entertaining talks. The meetings are being made more of a feature of the club life this year; and a strong effort is being made to bring the instructing members and the students in the Club into a close personal contact, which shall enable the undergraduate members to catch some of the force and enthusiasm of the men who instruct them.

#### MUSICAL CLUBS

The officers of the Musical Clubs for this year are president, Mortimer Bristol Foster, '01; vice-president, Harry Leslie Walker, '00; secretary, John Stanard Bronson; treasurer and assistant manager, Arthur Harold Sawyer, '02; manager, Henry Norman Hudson, '01.

The Club this year has been successful with its concerts. The first one was given in the Unitarian church, West Newton, November 17. After the concert light refreshments were served, and dancing followed.

On December 14 the Club gave a concert in Stoneham for the High School. The home concert was held on December 20. On December 26 the Clubs went to Lowell, and on the 28th to Gloucester. At both these concerts there was dancing after the music.

The Clubs are somewhat larger this season than last year, and their work is better. The concerts announced for next term are: February 16 at Reading; February 27, Everett Y. M. C. A.; March 1, Cambridge Y. M. C. A.; March 10, Colonial Club, Cambridge; March 30 at Boston Y. M. C. A.; April 25, spring concert and dance.



## ATHLETICS

As President Crafts quoted General Walker in saying that in our professional schools it may not be best to play football or other college games for the sake of winning, but merely for the exercise and pleasure derived from the game, our football scores for the fall of 1899 do not seem so discouraging.

Games were played with the New Hampshire State College at Durham, N.H., with Boston College at Boston, with Exeter at Exeter, with Wesleyan at Middletown, with Tufts at Somerville, with Worcester Tech at Worcester, with Amherst at Amherst, with Tufts at Boston, and with Brown University at Providence.

## ATHLETIC MEET

The annual Winter Indoor Meet of the Massachusetts Institute of Technology Athletic Association was held in the gymnasium on Exeter Street, over 300 being present.

The class team race was the most exciting event of the evening. It was run in four straight-away relays, of 35 yards each, by four men from each class. Two men from each class were stationed at each end of the gymnasium; and, when a man completed the 35 yards, he touched his team mate off for the dash back. '00 took the lead with its first man. McMaster and each successive man increased the lead; but on the last relay Pope, of '02, crept up even with Hull, of '00, the

finish being a dead heat. A second heat was then run between '00 and '02, Pope, '02, winning on the final relay from Wentworth, '00, by about four inches.

The 35-yard hurdles proved very interesting, and two of the heats were very close. The points were divided, so that the class of '00 won four points in this event, the class of '03 four points, the class of '02 taking the remaining point.

## SUMMARY

## THIRTY-FIVE YARD DASH.—

First heat won by Brown, '02; second, Wentworth, '00. Time, 4 2-5 sec. Second heat won by Hall, '00; second, Lowe, '02. Time, 4 1-5 sec. Third heat won by McMasters,

'00; second, Lord, '03. Time, 4 2-5 sec. Fourth heat won by Calley, '03; second, Maxson, '01. Time, 4 3-5 sec. Heat for second men won by Wentworth, '00; second, Maxson, '01. Time, 4 3-5 sec. Final heat won by Wentworth, '00; second, Hall, '00; third, Brown, '02. Time, 4 2-5 sec.

**THIRTY-FIVE YARD HURDLES.**—First heat won by Wentworth, '00; second, Baker, '02. Time, 4 4-5 sec. Second heat won by Pope, '02; second, Magnitzsky, '03. Time, 5 sec. Third heat won by Calley, '03; second, Rowe, '01. Time, 5 1-5 sec. Heat for second men won by Baker, '02; second, Rowe, '01. Time, 4 4-5 sec. Final heat, Wentworth, '00, and Calley, '03, dead heat; third, Pope, '02. Time, 4 4-5 sec.

**STANDING BROAD JUMP.**—Won by Baxter, '01, distance, 9 ft. 9 1-4 in.; second, Wilder, '01, distance 9 ft. 4 1-4 in.; third, Sawyer, '02, distance 9 ft. 2 1-4 in.

**RUNNING HIGH JUMP.**—Won by Baxter, '01, height 5 ft. 8 3-4 in.; second, Wentworth, '00, height 5 ft. 6 in.;

third, Pope, '02, height 5 ft. 4 3-4 in.

**FENCE VAULT.**—Won by McMaster, '00, height 6 ft. 4 1-2 in.; second, Conant, '00; third, Baxter, '01.

**SHOT PUT.**—Won by McDonald, '01, distance 36 ft. 2 1-2 in.; second, Winchester, '03, distance 34 ft. 10 1-4 in.; third, Crane, '02, distance 33 ft. 10 1-2 in.

**POTATO RACE.**—First heat won by Pope, '02, time 38 2-5 sec.; second, Lord, '03. Final heat won by McMaster, '00, time 38 sec.; second, Pope, '02; third, Baker, '02.

**RELAY RACE.**—Won by 1902 (team, Pope, Avery, Sawyer, Brown); second, 1900 (team: Hall, Wentworth, Grant, McMaster). Time, 18 sec. flat.

TABLE OF POINTS

<i>Event</i>	'00	'01	'02	'03
35-yard Dash	8		1	
35-yard Hurdles	4		1	4
Potato Race	5		4	
Running High Jump	3	5	1	
Standing Broad Jump		8	1	
Fence Vault	8	1		
Shot put		5	1	3
Totals	28	19	9	7

## THE GRADUATES

## REPORT OF WALKER MEMORIAL GYMNASIUM COMMITTEE

BOSTON, December 29, 1899.

*Mr. President, Ladies and Gentlemen,*—The Walker Memorial Gymnasium Committee appointed last year submits its first report of progress. The committee would be glad if the progress made had been greater; but, in its judgment, enough has been accomplished to justify some degree of satisfaction in the past and confidence as to the future.

The nomination of the committee was far from simple on account of the importance of representing a constituency of so wide a range, and the limited leisure of the members likely to be most efficient. The patience and good will of President Miller ultimately overcame these difficulties; but our first meeting was not held until March 4, and permanent organization was not effected until April. Much of the spring was devoted to the important task of planning our work, organizing the needful co-operation, preparing circulars, etc.

The main principles finally adopted by the committee for its canvass were briefly:—

1. To reach, if possible, every former student of the Institute.
2. To make special efforts to secure early subscriptions of \$500 or \$1,000.
3. To enlist the co-operation of class and local society representatives in such a way as to lighten the individual burden of labor and to give the appeal a personal quality.
4. To enlist the interest of Corporation, Faculty, and undergraduates as well as of alumni.

Triplicate typewritten lists were prepared of all former students by classes, from the Institute card catalogue. The secretary of each graduate class was requested to serve as an associate member of our committee or to nominate some other member of the class

for that purpose. Each associate member was supplied with a typewritten list of his class, and envelopes addressed to them containing the committee's general statement, subscription blanks, etc.

The results of the committee's efforts may be summarized as follows: —

The Corporation, through its Executive Committee, and the Faculty have appointed committees for conference with our own.

It has been difficult to obtain large subscriptions at the outset; but, aided by the generous example of certain members, we have secured eight subscriptions of \$500 or \$1,000 besides the \$600 due to the very successful work of the Walker Club of undergraduates in producing the English play in Junior Week.

Our efforts to secure co-operation have borne good fruit. Nearly every graduate class has been represented by an associate member of our committee; and at many of our meetings a large proportion of these associates have been present, keeping us in close touch with alumni opinion, and enabling us to assist, by comparison of notes, in meeting the serious difficulties attending the execution of our plans. In the large classes of recent years it became necessary to assist the associates by appointing a considerable number of canvassers to aid in the actual work of securing subscriptions.

We have received from 238 persons subscriptions amounting to \$20,860.10. Classified by amounts, we have received: 8 of \$500 or over; 17 of from \$200 to \$500; 43 of from \$100 to \$200; 170 of less than \$100.

Many of our subscribers have preferred not to state the amounts they expect to pay in future years, but have assured us that more will be given.

After careful consideration of a plan for an athletic field at a considerable distance from the Institute, it was voted not to recommend its purchase. The more fully the question of location has been discussed, the more complete has become the conviction of the committee that the Memorial Gymnasium should be in close proximity to the Institute buildings, and that for such proximity ground area can to some extent be sacrificed. The committee

recognizes fully that it can only ask the Corporation to assign costly land to this purpose by securing as large a subscription as possible.

In the report of last year, which led to the appointment of this committee, an attempt was made to present the general considerations which should lead Institute men to co-operate in this great and honorable undertaking. May we ask your further attention to some of these matters in the light of the experience we have gained during the year? The points to be emphasized may, for the sake of definiteness, be formulated as follows:—

1. We entertain no doubt that our general plan is entirely practicable; that \$100,000 is not too much to be asked from Institute men, that it is not too little to insure the fulfilment of our expressed purpose,—the erection and equipment of a memorial gymnasium.

2. We are convinced that, while many details must await future determination, the proposed memorial is the best possible.

3. We believe that the obligation to co-operate in this undertaking is one which all Institute men owe not less to themselves than to the Institute and to the memory of President Walker.

As to the capacity of Institute men to contribute \$100,000, it seems to us that, if the question needs answering at all, a negative answer would be absurd. There are more than two thousand living graduates. There are at least as many, and probably more, non-graduates who, from their length of connection with the Institute and their degree of interest, may as fairly be reckoned among our constituents. If these four thousand, making every allowance for individual inability and age, are not able to contribute on an average five dollars a year for five years, then the professional success of Institute men is not what it is well known to be by all of us and by the public at large. To fail to do this would discredit us.

The question of the adequacy of \$100,000, if secured, to the concrete undertaking in question is, we admit, one of real difficulty. The value of land within easy access is very high, and is continually rising. The gymnasium must be within easy access,

in order to meet the needs of the largest number of students and in order to constitute a fitting memorial. It must be clear, however, that the present state of affairs, with a low building covering a large area upon leased land of high value, cannot be of long duration; that, whenever a change has to be made, the Corporation will have to meet the question of location and high price of land; that the natural solution would be either to use relatively cheap land, such as that on Garrison Street, or to use one or more floors of a high building, perhaps in the vicinity of our present Trinity Place buildings, or to build a high gymnasium with a small ground area. Any one of these plans would involve a large outlay, which cannot be avoided without conflict with the present accepted views in regard to the physical interests of the students.

It is, in our judgment, this situation of the Institute which offers an altogether exceptional opportunity to its alumni. The \$100,000 which we have to secure is, of course, not adequate for land, building, and maintenance of any gymnasium worthy of the Institute or of being called a memorial to President Walker. But \$100,000 may be immensely helpful to the Corporation of the Institute in the erection of a new building, and may turn the scale between a building limited by the temporary financial capacity of the Institute treasury and a far better gymnasium, such as would satisfy Corporation, alumni, and undergraduates. It would not, of course, be fitting for the alumni to expect the Corporation to apply in the direction of a new gymnasium or its maintenance funds needed for still more important purposes. It is not, on the other hand, to be supposed that the Institute treasury should merely escape otherwise unavoidable expense by reason of our subscription. What we hope for is earnest co-operation in which the Institute shall do all it can and the alumni shall do all they can, and the result shall be better than either could accomplish alone, and a worthy memorial of our President. The precise terms of the co-operation are not capable of definition in advance, and were wisely left by vote of the Association to future agreement with the Corporation.

We may touch briefly upon some of the more personal considerations belonging to this question, although we realize that each

man's conscientious judgment of his own action is to be respected as final. It may be a pleasure for some of us to recall that, in helping the Institute thus, we are in a sense repaying to future students something of what we have gained from former benefaction. The Institute, like most colleges, is not merely an educational institution; but it is a public charity of the highest type. Aside from those who receive the whole or a part of their education from scholarship funds, each student pays the Institute for tuition not much more than one-half its actual cost.

Over and above all else stands the memorial element in our undertaking. The Institute had the great good fortune to have President Walker at its head during the best years of his life. The great majority of us knew him personally, and are by that fact broader and better. The enrichment of student life by a good gymnasium with opportunities for other proper social purposes is one of the things in which he would have taken the warmest interest. Shall we not see that his ideals and his name thus live?

He gives twice who gives quickly. Some wait for others, being doubtful as to the scale of contributions. If all hesitated, our work would be paralyzed. We owe much to the generous faith of a few who have been willing to lead the way. We appeal now to every man in every class not to let a few bear the burden longer, but to do his share, whether large or small.

It remains, Mr. President, to say a few words as to the future of our work. Interesting and difficult questions can hardly be separated from the subscription work with which we are charged. These relate mainly to the location and the character of the gymnasium. As to both, we must repeat that authority rests wholly in the government of the Institute. We have decided views and strong preferences, which are, so far as we know, not at variance with those of the Corporation and Faculty, but are not within their present means. The weight which will be given our opinions will depend largely upon the extent to which you support them by your contributions. We believe that the gymnasium should be very near the other buildings, that it should be of simple but dignified architecture, that it should be planned for future and

not merely for present needs, that it should be not only a place for physical exercise, but should by means of reading-rooms, society-rooms, offices, etc., concentrate a wide range of student interests. All this costs. If you believe in it, we count on your support. To these general questions, and others which it would be premature to state at this time, your committee must give earnest consideration. We shall welcome expressions of opinion from other Institute men who appreciate justly the considerations involved, and shall hope in our next report to show progress on these lines. For the present we desire to mark the position we have reached by presenting for your action the following votes, stated in substance in the call for this meeting:—

*Voted*, That the Walker Memorial Gymnasium Committee be authorized to confer with the Corporation of the Institute, in behalf of the Association, in regard to the purchase of suitable land for the gymnasium.

*Voted*, That it is the sense of the Association that the Walker Memorial Gymnasium should include, if possible, provision for other social objects, with a view to the promotion among the students generally of a closer attachment for each other and for the Institute.

The above votes were passed unanimously.

#### THE WASHINGTON SOCIETY OF MASSACHUSETTS INSTITUTE TECHNOLOGY

The Washington Society of the Massachusetts Institute of Technology held its second informal dinner on December 9 last. The following were present: A. E. Adams, '96; R. E. Bakenhus, '96; F. E. L. Beal, '71; T. B. Booth, '95; H. P. Browne, '96; Winthrop Cole, '87; Edward Collins, '88; A. V. Curtis, '97; P. L. Dougherty, '97; F. L. Edmands, '97; A. W. Grosvenor, '98; L. F. Hewins, '98; S. A. Hooker, '98; T. M. Keene, '91; C. E. Lord, '98; F. E. Matthes, '95; G. H. Matthes, '95; F. H. Newell, '85; A. L. Parsons, '97; A. W. Proctor, '99; William J. Rich, '84; F. T. Schneider, '92; W. W. Stevens, '98; J. E. Woodwell, '96; J. E. Wright, '72.

The first annual meeting, the society having been organized



February, 1899, was held immediately after the dinner. Officers for the ensuing year were elected as follows: president, F. H. Newell, '85; vice-president, H. A. Pressey, '96; secretary, R. E. Bakenhus, '96; treasurer, A. W. Proctor, '99; member of Executive Committee (in addition to the above), F. E. L. Beal, '71.

The society has continued to prosper, owing to the mutual interest which Institute men feel in one another. Great pleasure is derived from the occasional gatherings, and it is planned to have them more frequently during the coming year. The meeting of December 9 was the largest so far held. The society has lost a few members, due to removal from Washington; but about double the number of new men have arrived. Tech men who visit Washington or who expect to reside there are invited to communicate with the officers of the society, as there is a "Committee on Hospitality," whose function it is to entertain such Tech men as far as possible and enable them to meet other Tech men of this vicinity.

It is expected that a sheet of additions and changes for the directory of the society will soon be issued, in order to make this little pamphlet correct to date.

#### NORTH-WESTERN ALUMNI ASSOCIATION

The annual banquet of the North-western Association will be held in Chicago at the University Club early in February. The Association holds regular meetings on the 16th of each month. At the December meeting Mr. C. E. Woods, President of the Woods Electric Vehicle Company, talked on the status and future of the automobile, and illustrated his remarks with apparatus used in the equipment of electric vehicles.

#### THE TECHNOLOGY CLUB

On October 9 the annual meeting of the Technology Club was held; the report of the Nominating Committee was accepted, and the following officers were elected: secretary, Walter Hum-

phreys, '97; treasurer, Walter E. Piper, '94; members of the council for three years, Albert F. Bemis, '93, Frank L. Locke, '86, Edward G. Thomas, '87, Edwin C. Miller, '79, and George W. Sherman, '94.

Immediately after the meeting the council met, and elected James P. Munroe, '82, president, and Francis H. Williams, '73, vice-president.

Several smoke talks have been held during this season. On the evening of November 3 the first one was given, at which Mr. Howard A. Carson, '69, spoke on "Some Things seen by an Engineer during an Excursion in Egypt." It was illustrated by the stereopticon. On the evening of November 17 a second talk was given by Mr. Edwin S. Crandon, financial editor of the Boston *Transcript*, who spoke on "Old Boston, England." The third talk was given November 24 by Dr. Henry A. Wolff, of New York, who was for sixteen years a resident of the Transvaal and a member of the Johannesburg Reform Committee; and he spoke of the "Transvaal and the Present Crisis." On Thursday evening, December 7, a talk was given by Mrs. Mabel Loomis Todd on a "Trip to Esashi," a spot twelve hundred miles north of Yokohama, in a region never before visited by a foreign woman. It was Ladies' Night, and many applications for tickets had to be refused because of the large demand and comparatively small seating capacity of the reception-room. On Wednesday evening, December 27, the club entertained very informally the American Historical Society—meeting in Boston—at a smoker, where Welsh rarebit was served to the one hundred and seventy-five guests. On Wednesday evening, January 3, the fifth talk of the season was held. Professor Arlo Bates spoke on "Anglo-Saxon Natural Science."

## NEWS FROM THE CLASSES

1868.

PROF. R. H. RICHARDS, *Sec.*  
Mass. Inst. Technology, Boston.

Whitney Conant was in Boston recently. He still makes his home at Long Branch, N.J., where he is manager of the water company and vice-president of the Citizens' Bank. — B. P. Tilden in the spring of 1881 entered the service of the Northern Pacific Railroad, and remained with them until 1892; then spent one year with the "Soo." During those twelve years he was mostly engaged in general railroad engineering and construction; had many enjoyable situations to work in, as, for instance, Yellowstone Park, Lake Chelan, and Columbia River regions, in Washington, and several other interesting trips among the Rocky and Cascade Mountains. Altogether a grand experience, and profitable. In 1882 he married, and settled in Jamestown, N.D., which is now his home. Of course, no one could be city engineer but him; and, while resident there, he has had the pleasure of

seeing proper sewerage system inaugurated and partially developed, and a water works system, the supply coming from two of the noted North Dakota artesian wells,—they are about fifteen hundred feet deep,—one a three-inch and the other a six-inch tube. The latter is just completed. In 1895 he entered the office of the United States Surveyor-general of that State, in general charge of the draughting and surveying work; became a regular civil service employee under the executive order without having to pass an examination.

1869.

H. A. CARSON, *Rep.*  
20 Beacon Street, Boston.

William H. Baker, I., has gone into the insurance business at his home at Fitchburg, Mass.

1870.

PROF. CHARLES R. CROSS, *Sec.*  
Mass. Inst. Technology, Boston.

In a letter to a classmate Sampson D. Mason writes:

"After graduation I went West, and was connected with the construction of several unimportant railroads in Michigan and Indiana. In 1880 I was fortunate in being employed by the Northern Pacific, then just entering upon a lease of new life and pushing its road westward from the Missouri River. The Western headquarters are at St. Paul, Minn., the home of our classmate, S. M. Cary, dealer in railway supplies, a business closely allied to railroad building, and which resulted in bringing us into exceedingly pleasant relations. Among the number of Institute men who were prominently connected with the building of the Northern Pacific are Tilden, '68; Weeks, '71; Shailer, '73; Howe, '79 (recently become a Benedict); and Horn, '88. The latter is now one of the division superintendents. In 1892 I was sent to Tacoma as representative of the Purchasing Department on the Pacific Coast. It was with great reluctance that I left St. Paul, for the State of Washington at that time presented few charms; and I made up my mind to never be happy again. I left

the Northern Pacific in 1897, and at present am on one of the most beautiful islands in Puget Sound, superintending building modern fortifications under the United States engineers. A magnificent body of water rolls around us, capable of floating all the navies in the world, and, probably, the merchant marine as well. The broad strait of Juan de Fuca, twenty miles wide, opens direct to the ocean; and in clear weather the queen's dominions can be seen in the north-west. This Whidby Island is at the entrance to Puget Sound, or 'Whulge,' as the native Indian terms it. It is five miles across to the main land, where other strong forts are being built; and to a non-military man the entrance seems impregably defended. Indeed, the great and growing interests of citizen and government demand most absolute protection. The United States has one of its best and largest dry docks fifty miles south, a large army post at Magnolia Bluff, and at Seattle the rendezvous for coast survey vessels and revenue cutters. Besides the government properties centred about here, are the

cities of Port Townsend, Seattle, Tacoma, and the capital of the State, Olympia, all thriving, ambitious places. The golden stream from Alaska flows past our great guns, seeking security in vaults and assay offices. Many transports for Manila are despatched from these ports, and the largest battleships have tested the dry dock. Commerce with the Orient is growing fast, and will unquestionably be permanent. The climate of this part of Washington is tempered by the warm currents of the proximate ocean. The few frosts are without severity, and the snowfall light, infrequent, and of short duration. Irrigation is unnecessary; and the farms, small compared with those in the eastern part of the State, are prolific. Coal abounds in great quantities and is of fairly good quality. Large coke ovens are in successful operation. The lumber is unsurpassed, and I am told our classmate Nat Herreshoff obtained the spars of the 'Defender' from our forests. Many Eastern people are here, and capital from the older States is being invested. The Tacoma School Exhibit took first prize

at the World's Fair; and a local Tannin Extract Company shows, with pardonable pride, a medal from the same source. I expect this north-west corner of the United States will ultimately be the pearl of the Union. But I am not writing a paper to induce immigration. Let me give a brief practical illustration of the value of an Institute certificate. After I had been here a short time, an increase in salary attracted the attention of some civil service clerk in Washington, who promptly held up the pay accounts of my superior, advising him the advance was unauthorized and must be discontinued. Moreover, the recipient must refund the money so illegally drawn from the public purse unless he could show a diploma as a graduate civil engineer from some school of high standing. You may be assured I lost no time in producing my sheepskin, which, doubtless, was regarded with admiration, and, I trust, with all the respect due to the signatures of John D. Runkle and Samuel Kneeland. I am happy to state the result has been quite satisfactory to myself. It does me so much good

to hear from you and to think about the old times that I believe I shall change my mind and be happy after all."—J. A. Osgood writes from Los Angeles, Cal., how hard the last two years have been on his ranch, because of the great drought.

1873.

S. E. TINKHAM, *Sec.*

City Hall, Boston.

William E. Brotherton, V., has left Burkhardt & Co., and is now associated with the firm of Rogers, Brown & Co. of Cincinnati, Ohio.

1874.

CHARLES F. READ, *Sec.*

Old State House, Boston.

Charles F. Read, the secretary of the class, has been elected clerk and treasurer of the Bostonian Society, Old State House.—H. B. Perkins, I., has been made a full professor of mathematics at the Shrook Polytechnical Institute of Pasadena, Cal.—William Foster has just made a professional visit to Boston, preparatory to a tour in Arizona.

1876.

JOHN R. FREEMAN, *Sec.*

4 Market Square, Providence, R.I.

J. H. Susmann, III., who is with Lewisohn Brothers of New York, was recently in Boston on a professional visit.—Samuel James, Jr., III., is now at the Globe Plant of the American Smelting & Refining Company in Denver, Col.

1880.

PROF. G. H. BARTON, *Rep.*

Mass. Inst. Tech., Boston.

Cass Gilbert, of Minneapolis, Minn., has been appointed the architect of the new Government Building of New York.

1881.

FRANK H. BRIGGS, *Sec.*

2 High Street, Boston.

Evelyn W. Ordway is president of the Era Club, New Orleans, president of the Women's Branch Alliance, Unitarian Church, and secretary of board of the New Orleans Free Kindergarten Association. She has delivered two addresses before the Quarante Club of New Orleans, and has

written two papers for the Chemical Society. — Webster Norris, III., has been recently appointed superintendent of the Mechanical Department of the Canadian Rubber Company of Montreal.

1882.

WALTER B. SNOW, *Sec.*

Watertown, Mass.

Henry E. Snow, manager of the Snow-Mackay Advertising Agency, is now located at 27 School Street, Boston.—Edgar B. Thompson was married June 28, 1899, to Miss Anna G. Stoker, of Watertown, S.D.—Walter B. Snow has recently lectured on "Mechanical Ventilation and Heating" at Cornell, McGill, Columbia, and Sheffield Scientific School.—Rufus F. Herrick is now located at 115 High Street, Boston, as consulting chemist for the New York and Boston Dye-wood Company, with laboratories at East Boston and New York.—The class was represented at the alumni dinner by French, Herrick, Munroe, W. B. Snow, and A. W. Walker.

1883.

HARVEY S. CHASE, *Sec.*

8 Congress Street, Boston.

William B. Fuller has been for the past two years resident engineer, contracting a slow sand water-filtering plant at Albany, N.Y., which is now finished and in running order. It is a modern, up-to-date plant, the largest thing of its kind in the United States, and is probably the forerunner of many similar plants. He has recently returned from some expert work in relation to water filtration for the city of Philadelphia, Pa.—The engagement is announced of Miss Grace F. Batchelder, only daughter of Mr. and Mrs. W. O. Batchelder, and George R. Underwood, superintendent of the American Glue Company's works in this town.—Horace B. Gale was elected to the State legislature as representative from his native city, Natick, at the last election. Gale has been taking an active part in public affairs of his city for the past two years. He is secretary of the School Board and secretary of the Citizens' Committee; and, owing in great part to his activity, the com-

plexion of politics has been decidedly changed for the better in that city.—Chase has had on his hands the case of the Mayor of Haverhill, Mass. (elected on the Social Democratic ticket) *v.* the Haverhill Gas Company, which was heard in November and December before the State Commissioners. He has recently been auditing the accounts of the treasurer of Harvard College.—Two more volumes were added November 29 to the library of President Walker's works at the Technology Club; viz., "Studies in Economics," Vols. I. and II., edited by Dr. Dewey. There are now eighteen volumes, bound in the Institute colors, crimson with silver gray lettering, the gift of '83 to the club. A large photograph of President Walker now hangs above the oak bookcase, which was also a gift from the class. The case has double shelves, with green silk curtains at the sides, and a silvered plate in the centre with the words "Given by '83." Each of the books has also "'83" in silver figures in the centre of the cover.—

Leonard has had two factories burned within the past few years, but now has a new one equipped with sprinklers and running full tilt on rheostats, circuit-breakers, outlet-boxes, and general and special enamel work. His method of motor control has been adopted by the navy, and played an important part in the work of the "Brooklyn's" turrets at the battle of Santiago, and is on the "Kentucky," "Kearsarge," "Alabama," "Wisconsin," and all new ships. Also used in controlling the rudder on several ships. Leonard's factory is doing about 50 per cent. export business, and he will have four hundred square feet at Paris next year. He goes abroad in January with his family, to be away about a year. Leonard was married some years ago, and has his home at 114th Street and Riverside Drive, New York, but will build in Bronxville, probably, to be near his factory and to get the advantages of this very attractive country suburb of New York. He is patentee of a steam automobile, also, which will go on the market shortly.



1884.

PROF. AUGUSTUS H. GILL, *Sec.*

Mass. Inst. Technology, Boston.

P. S. Morse, III., has accepted a position with the American Smelting & Refining Company of Leadville, Col.—C. O. Prescott, V., has gone to the Powder Point School at Duxbury, Mass., as instructor.—The secretary, in looking over a list of members of the Society of Chemical Industry resident in America, found the name of Henry D. Hooker. It looked so familiar that he ventured to communicate with him, with the result that a most cordial letter was received. He practises architecture with R. L. Dans, 26 Court Street, Brooklyn, N.Y., “and only plays at chemistry.”—F. C. Williams, Jr., I., has become city engineer and county surveyor in Sheridan, Wyo.—T. W. Robinson, III., has left Pueblo to become general superintendent of the Joliet Works of the Illinois Steel Company, located at Joliet, Ill.—D. A. Lylie, III., has been promoted from captain to major, U.S.A., Ordnance Department.

1885.

A. D. LITTLE, *Sec.*

7 Exchange Place, Boston.

C. A. Brown has been elected secretary of the Boston Paper Trade Association.—I. W. Litchfield is still with the Deering Harvester Company, Chicago. He was East for two weeks this summer.—Tracy Lyon has been appointed general superintendent of the Great Western Railway.—Oakes Ames has been elected a director in the recently organized American Telephone, Telegraph, & Cable Company.—E. B. Homer has an article in the present number on his summer school abroad.—H. J. Williams is engaged upon an exhaustive study of the calorific power of coal, the results of which will be published in book form.—M. E. Recuero has resigned the treasurership of the Panama Water Works, and is now a commission merchant, his address being Apartado 91, Panama, Central America.—The present address of Josiah Pierce, Jr., is 1325 Massachusetts Avenue, Washington, D.C.—A. D. Little was elected

president of the North-eastern Section of the American Chemical Society at its October meeting.

1887.

EDWARD G. THOMAS, *Sec.*

89 State Street, Boston.

George W. Davenport has become vice-president of the Planters' Compress Company. His office is at 89 State Street. — Henry F. Stoddard is now located with the Watson Machine Company, Paterson, N.J., who are one of the most prominent makers of cordage machinery. — Gelett Burgess is in Boston for the winter. — George W. Patterson, Jr., VI., in June was the recipient of the degree of Ph.D. from Munich University. — G. A. Armington, II., has been appointed to the position of manager in the Cleveland & Crane Car Company.

1888.

W. G. SNOW, *Sec.*

4 Post-office Square, Boston.

The firm of Winslow, Wetherell & Bigelow, architects, Boston, of which H. F. Bigelow is a member, have been invited by the Secretary of the Treasury to

submit competitive designs for the new Baltimore custom-house. — The secretary would like to learn the address of Julian V. Wright. — Ambrose P. Gaines is now general manager of the Jefferson Iron Company, manufacturer of charcoal pig iron, Jefferson, Tex. — The engagement is announced of Miss Katherine Greer, of Chicago, to B. R. T. Collins. — Subscriptions to the Walker Memorial Gymnasium Fund continue to come in. Let others join. — George C. Shattuck is now of the firm of Maxwell & Shattuck, architects, Montreal. — Russell Robb is in Bombay, India, making an investigation of the tramways with reference to the introduction of electric power. — George D. Moore, who was with the class during the first year, then went to West Point, is now with the U.S.A. in the Philippines. — Frederick H. Safford, VI., has been made assistant professor of mathematics and mathematical physics at the University of Cincinnati. — R. H. Colby, V., has been elected president of the Aurora Metal Company of Illinois. — F. M. James, II., is now draughting with the General Electric Company in Lynn.

1889.

FRANK L. PIERCE, *Sec.*

31 Milk Street, Boston.

Clayton W. Pike of Keller, Pike & Co., contractors, Reading Terminal Building, Philadelphia, had charge of the installation of all the electrical apparatus in connection with the power appliances required for the Export Exposition recently held in Philadelphia.—Walter G. Wuichet is with the Pasteur Filter Company, Dayton, Ohio, as superintendent in charge of manufacturing and sales.—Paul R. Hawkins, who served through the Cuban campaign as adjutant, is now major in the Second Massachusetts Regiment. Governor Crane has appointed Major Hawkins a member of his staff.—John W. Linzee, Jr., is assistant engineer with the Boston Elevated Railway Company.—A. L. Davis, II., is assistant to the manager of the Berlin Iron & Bridge Company of East Berlin, Conn.

1890.

GEORGE L. GILMORE, *Sec.*

Lexington, Mass.

Charles W. Sherman was made the happy father of a son,

born December 6. The name of the youngster is John MacDuffie Sherman, and twenty years from now will undoubtedly find him grinding at Technology.—Dr. and Mrs. W. G. Curtis are residing in Wollaston, Mass., where the doctor is practising his profession. Mrs. Curtis is a sister of H. B. Burley, also of the class of '90, and who is in the Insurance Inspection Department of the Mutual Companies.—Calvin W. Rice, electrician of the subways of the city of New York, gave a lecture, November 15, before the students of the Purdue University, Lafayette, Ind. The lecture was illustrated with over one hundred lantern views, made especially for the occasion, to show the development of high-tension electrical apparatus and service. Before the lecture Mr. Rice was tendered a dinner by the director of the Engineering Laboratory and the professors of engineering, history, botany, and agriculture.—Charles W. Sherman has recently been elected junior editor of the journal of the New England Water Works Association, and is also acting as hydraulic engineer for the city of Boston

in the case of the Boston Belting Company and the city of Boston, which is now being tried before auditors for damage caused by the taking and altering the flow of Stony Brook.—Charles F. Koch was married October 31 to Miss Jessie Achert, and they will be at home to their friends at “The Pitton,” West McMillan Street, Cincinnati, Ohio.—George W. Fuller was married November 9 to Miss Caroline T. Goodloe, and will reside in Louisville, Ky., where he is engaged in business.—H. P. Spaulding, the artist, is located at the “Westland,” Westland Avenue, Boston, for the winter, where he has his studio. Mr. and Mrs. Spaulding issued “at home” cards to their friends for November 23 and December 7 and 14.—E. B. Raymond became the father of a small boy a few weeks ago.—George D. Chapman is at present engaged in some important engineering work in Philadelphia for the New York Ship Building Company, where they will employ about three thousand men.—George A. Packard has been engaged this fall in Silverton, Col., but on account of severe

weather has been obliged to come out, and is now at Denver.—Atherton Loring is with the Library Bureau, 530 Atlantic Avenue, Boston.—Mr. and Mrs. A. D. Boss have been in the Tim Pond region of Maine during September, enjoying the fly fishing and canoeing.—It is rumored that Billy Fenn was made the proud father of twins during the past year.—Frank M. Greenlaw, who last year was teaching in Worcester, has been appointed teacher of physics at the Lynn High School.—H. C. Slater was married September 6 to Miss Mary L. Hunt, and will reside in Milwaukee, Wis., where he is engaged in the engineering business.—Spaulding Bartlett has been appointed superintendent of the Slater Woollen Mills, Webster, Mass.

1891.

H. A. FISKE, *Sec.*

93 Water Street, Boston.

F. C. Blanchard has been engaged since last March as superintendent and mechanical engineer for American Warp Drawing Machine Company.—K. W. Mansfield has been recently promoted from superin-

tendent to vice-president and general manager of the Norwalk (Conn.) Tramway Company. He is secretary and director of the Norwalk Business Men's Association.—H. E. Hathaway, formerly chemist for the Silver Spring Bleach & Dye Works, Providence, is now with the Waldrich Bleachery, Delawanna, N. J.—P. W. England has had personal charge of the laying of underground conduits for the Bell Telephone Company at Philadelphia.—H. S. Kimball is installing a plant for the manufacture of hydrate of alumina (Bayer patents) at the Pennsylvania Salt Manufacturing Company at Natrona, Penn.—Gorham Dana recently gave an illustrated lecture on the Yosemite Valley before the Appalachian Mountain Club at Boston.—F. A. Wilson was married last June to Alice Perkins Campbell.—L. C. Wason has served as secretary of the Brookline Union (Y. M. C. A.) for the last eight years.—S. W. Wilder has recently been appointed manager for the Merriam Chemical Company with offices at 75-77 Broad Street, Boston.—H. I. Cole, II., has

left the Atlantic Iron Works to take a position as draughtsman in the department of construction and repair at the Charlestown Navy Yard.—A. W. Moseley has left William Sellers & Co. of Philadelphia to accept a position as assistant professor at the Michigan Agricultural College. He will be with Professor Charles L. Weil, of the class of '88.—Charles W. Ricker, of Buffalo, N. Y., has been appointed consulting electrical engineer of the United States Securities Company of Boston.

1892.

PROF. SEVERANCE BURRAGE, *Sec.*  
Purdue University, Lafayette, Ind.

William R. Kales is in business in Detroit. The firm name is Whitehead & Kales, contractors and engineers in steel and iron work.—James P. Buckley, who is president of the Crescent Brass & Iron Company of Detroit, served in the navy during the Spanish-American War.—Dr. Douglas A. Cater is practising medicine in Orange, N. J.—Frederick H. Meserve was married November 6, 1899, to Miss Edith

Turner, of New York. He is with Deering, Milliken & Co., dry goods commission merchants of New York.—Logan Feland, who was captain in the Third Regiment of Kentucky Volunteers, now holds a commission of lieutenant in the United States Marine Corps, and is in the Philippines.—Murray Warner is Western agent for the International Power Company, his headquarters being in the Old Colony Building, Chicago. He was an assistant engineer in the navy for six months during the Spanish War.—Charles H. Chase is a trustee of the Stoneham (Mass.) Public Library.—Severance Burrage read two papers before the Indiana Academy of Science on December 28, one on "Insects as Factors in the Spread of Bacterial Diseases," and the other (with D. B. Luten) "Preliminary Notes on the Hygienic Value of Various Street Pavements as determined by Bacteriological Analyses."—Ralph H. Sweetser, III., formerly superintendent of Everett Furnace, Everett, Pa., is now assistant to the president of the Salem Iron Company at Leetonia, Ohio.—

W. S. Hutchinson, III., is at present engaged in putting in a trial plant for concentrating fine iron ore in Virginia.—John F. Vining, IV., is draughting for Allen & Vance, architects, of this city.—Theodore H. Skinner is instructing in the Architectural Department at the Institute this winter, supplying the place of H. W. Gardiner, who is travelling abroad. Mr. Skinner still continues his professional work, however, as an architect in Boston, and has formed a partnership with George D. Rand, formerly of Rand & Taylor, with offices in the Tremont Building.—Albert S. Heywood was married September 28, at Atlanta, Ga., to Miss Laura C. Faute.—Albert F. Sargent was married at Malden, Mass., on September 5, to Miss Clara L. West.—George V. Wendell has returned from Germany, and resumes his duties at the M. I. T., in the Physics Department.

1893.

FREDERICK H. FAY, *Sec.*

60 City Hall, Boston.

A son arrived in the family of Fred N. Dillon of Fitch-



burg last September. Honors do not come singly to our former class president, for he has recently become a member of the Fitchburg Park Commission.—Robert N. Wallis, also of Fitchburg, has entered the field of politics. In 1899 he was a member of the Common Council of that city, to which body he has just been re-elected, and is mentioned as a candidate for the presidency of the Council for 1900.—The address of George I. King is now 46 Palmer Avenue, Detroit, Mich.—Edward McKim Hagar and Miss Martha Worthington Barry were married at the home of the bride at Mount Ida, Dorchester, Mass., December 6, 1899, by Rev. Walter E. C. Smith, rector of St. Mary's Episcopal Church of Dorchester. Only the immediate families were present, including Edmund D. Barry, M. I. T. '95, who was on from Philadelphia for the wedding. Mr. and Mrs. Hagar made a short trip to New York, Philadelphia, and Chicago, returning to Boston for the Christmas holidays. They will reside in Chicago. Beginning with the present year, Hagar becomes manager of the cement and brick

department of the Illinois Steel Company, succeeding in that position Jasper Whiting, M. I. T. '89. Hagar's address is now 1041 The Rookery, Chicago, Ill.—W. A. Tucker, III., is at present in the East, recovering his health. He expects to return to the Calumet & Hecla Works about January 1.—H. W. Alden, II., is with the Pope Manufacturing Company, in the Motor Carriage Department, at Hartford.—Arthur H. Jameson, V., has accepted the position of superintendent and chemist of the Logan Manufacturing Company at Phoenixville, Pa.—C. R. Walker, V., has just returned from Idaho, where he has been investigating hydraulic gold mining.—George L. Walker, formerly master mechanic of the Department of Street Cleaning, New York City, while that department was under the charge of the eminent sanitary engineer, the late Colonel George E. Waring, Jr., is now consulting engineer with the City Wastes Disposal Company of New York. This company is organized from the staff of the late Colonel Waring for the purpose of contracting with or

giving advice to communities in the matter of the disposal of sewage, garbage, and rubbish, and the cleaning of streets.—

C. A. Meade, '94, formerly superintendent of Final Disposition, New York Street Cleaning Department, is also a consulting engineer of the company.—Albert Farwell Bemis and Miss Faith Mary Gregg, daughter of Rev. and Mrs. James B. Gregg, were married at Colorado Springs, Col., December 30, 1899.—T. T. Dormin has accepted a position with Wetmore & Jennet, patent attorneys, in New York.—John W. Logan, II., has gone into the steel casting business as the head of the Logan Manufacturing Company, and is putting up a plant at Phoenixville, Pa., where steel will be made by a new process. Steel, iron, and malleable castings will be made.

1894.

W. E. PIPER, *Sec.*

Fells, Mass.

H. R. Batcheller has just finished a special research for the Mexican Mining Company.—On November 1, twelve members of the class of '94

dined together at the Technology Club, and afterward attended the theatre.

1895.

E. H. HUXLEY, *Sec.*

29 Hampshire St., Camb'port, Mass.

The secretary especially urges a prompt response to the letter just sent out regarding the subscription to the Walker Memorial Gymnasium Fund. The class is behind in its subscription, and every man must work hard to bring the sum up to the required amount.—It is with regret that I announce the death of Walter Ellis, Course I. He died October 4, of typhoid fever. He was a popular man, and his death will be felt by those who knew him best.—Azal Ames, Jr., has a good position as Supervisor of Tracks on the N. Y. C. & H. R. R.R., with headquarters at High Bridge, New York.—L. W. Ballou returned in October from a trip abroad, where he has spent the summer.—S. S. Sadtler has gone back to Philadelphia, where he has opened an office as consulting chemist.—The secretary urges all who have not already done



so to subscribe for the REVIEW. The list of subscribers from '95 is smaller than it ought to be.—R. D. Farquhar returned to Paris this fall to continue his work in architecture.—G. R. Howarth has given up his position with the Baldwin Locomotive Works, Philadelphia, and returned to Providence.—Hermann Kotzschmar, Jr., was married in November to Miss Emerson, of Wellesley, Mass.—J. L. Newell, X., has gone to Springfield, to engage in the practice of law. He has received the first prize of \$375, as the college graduate of the class of '99, Boston University Law School, maintaining the highest rank during the three years' course at the Law School.—Gerard Swope has gone to St. Louis, where he will represent the Western Electric Company, with whom he has been connected since graduation.

1896.

F. E. GUPTILL, *Sec.*

71 Newbury Street, Boston.

Elbridge C. Jacobs, who at the beginning of the school year was appointed to an instructorship in chemistry at the Uni-

versity of Vermont, has been spending the holidays in Boston.—John L. Putnam, who is residing in Chicago, was seen in Boston recently.—A. H. Spahr, who recently received an appointment in the Treasury Department at Washington, did not relish his duties, and has again taken up architect's work in this city.—William D. Coolidge, Ph. D., who has been studying in Leipzig, Germany, since graduation, is back at the Institute again, and will tell us of some of his experiences in a talk at the class dinner, February 7.—Charles S. Newhall, who until recently has been in the employ of the Anglo-Mexican Mining Company in Sinaloa, Mexico, is still at his home in Lynn, but expects to return to Mexico very soon.—C. H. Young was one of the ushers at the wedding of Miss Mabel Kittredge and Charles Dunn, '97, in Ashmont, last November. Mr. Young returned to New York the day following the wedding.—The Tuileries, at 270 Commonwealth Avenue, is now under the management of F. M. Crosby, '96. We wish Mr. Crosby great success in his undertaking.—Both Jo-

seph H. Knight and M. E. Pierce are now full-fledged lawyers, with offices "down town."—The class dinner will be held at Hotel Brunswick on Wednesday evening, February 7. Business meeting, 6.30, and dinner following at 7.30. Music will be furnished during the courses, followed by the usual number of toasts. A large gathering is expected.—F. C. Field is of the firm of Field & Everett, electricians, 43 Cedar Street, New York.—Meyer J. Sturm, IV., paid the TECH editors a flying visit recently.—Charles S. Newhall, III., ran up to Boston last week from the City of Mexico to renew old acquaintance.—Winthrop Coolidge was married to Miss Marie Knowlton on Tuesday, January 2, in Chicago. They will be at home during March at their home 4752 Kimbark Avenue.—H. A. Pressey was married last October to Miss A. P. Fitch, of Washingtonville, N.Y.—L. K. Sager has accepted a position as assistant examiner in the Patent Office.—R. E. Bakenhus has been appointed instructor in civil engineering at Columbian University, Washington, D.C.

1897.

JOHN A. COLLINS, JR., *Sec.*

55 Jackson Street, Lawrence, Mass.

The third annual alumni class dinner of the class of '97 was held at the Technology Club on Saturday evening, December 9, 1899. Fourteen members were present. A number of the men who have always attended previous dinners have moved away from Boston, which fact accounts for the smaller number as compared with previous years. The table was laid in the dining-room, and was very prettily decorated with fruit and flowers. A full course dinner was served; and great credit is due to the culinary department of the club for the success of the same. After the dinner the speaking was wholly informal. Several matters of business were discussed at length. One of the questions concerned the advisability of holding the annual dinner each year at the club. Not a few of the men favored holding the dinner at a hotel or outside club, where greater freedom in regard to certain matters might be had. All agreed that the dinners at

the club were first-class in every way : still, it was thought best to give the other plan a trial. It was therefore voted to hold next year's dinner at the University Club, if possible. If not there, then at some hotel to be selected by a suitable committee.—Mr. Walter Humphreys read a letter from the superintendent of the Liberty Bell Gold Mine, Telluride, Col., giving the details of the death of Thurlow Washburn. This paper is given complete in this issue. By a unanimous rising vote, it was ordered that a vote of sympathy be sent to Washburn's family. Finally, the secretary called upon each man to tell a story; and the collection was varied and amusing. The gathering broke up shortly after eleven.

“KANSAS CITY, MO., Oct. 21, 1899.

R. P. ROTHWELL, Esq., Editor  
*Engineering and Mining Journal*, Postal Telegraph Building,  
New York.

*Dear Sir*,—I write this letter to ask that you kindly give space in your columns to the following notice of the untimely death of Thurlow Washburn, assistant superintendent of the Liberty Bell Gold Mine of

Telluride, Col. This for the benefit of his friends and in testimony of esteem. Mr. Washburn died a victim of the recent severe snow-storm in the Rocky Mountains. On Thursday morning, October 12, he started on horseback from Telluride to inspect certain work being done for the company on the high mountain range. There was a light snow falling in the valley at the time he started, but nothing serious; and, as an early visit was of considerable importance, after discussing the matter with Mr. Mercer, the superintendent, he decided to go ahead as far as he could on horseback, then turn the horse loose and proceed on foot. The horse came back about noon of the same day. The storm increased in violence, and continued until Sunday night; but no anxiety was felt, because it was supposed Mr. Washburn had reached the cabin, and was waiting there until the storm let up. On Monday Mr. Mercer was preparing to go over the range, when two of the men arrived from the camp, and reported that they had seen nothing of Mr. Washburn. Parties were immedi-

ately sent into the different basins, and search was continued uninterruptedly; but not until Wednesday was the body found, a short distance beyond the Virginus Pass. It appears that he must have been well started down from the pass toward the camp and cabin, almost within shouting distance, when a slide struck him, and threw him headforemost. He was found with about five feet of snow over him and two feet under him. Probably death came quickly, as there were no signs of his having struggled or suffered. Mr. Washburn was about thirty years of age, and was a graduate of the Massachusetts Institute of Technology, class of 1897. Previous to entering the Institute, he had spent a number of years in the West, principally in ranching in New Mexico; and he had also been occupied in railway work. Comparatively late he decided to adopt mining engineering as a profession. His first work for us was in the employ of the United States & British Columbia Mining Company in New Mexico, where he conducted an examination of certain properties in the Black Range in the autumn of 1898.

From there he was transferred to Telluride, and first occupied the position of assayer of the Liberty Bell Gold Mine. In the spring of 1899 he was advanced to the position of assistant superintendent, which he filled until his death. Mr. Washburn's work for our companies was in all respects most satisfactory, and gave every promise of rapid advance in his late chosen profession. He was most thorough, conscientious, and untiring in the performance of his duties. There was no task so arduous or disagreeable that he would shrink from it; and, withal, his was a cheerful and sociable nature, that of a good companion and loyal friend. The earlier years of his life, as he quite recently related to me, had been years of strife with the obstacles and reverses of Western life, through which he had borne himself manfully and without complaint. Now that he seemed well started on the road to accomplishment and success, he was stricken down. He died as he had lived, fearlessly striving to do his duty, regardless of consequences. One can imagine him breasting the terrible bliz-

zard on those lone mountain heights, winning his way arduously up the steep slope to the pass, step by step, through the deepening snow and against the blinding, biting blast, resting in the shelter of the notch at the summit with relief that the hard task was over and the goal already in sight, starting refreshed down the slope on the home stretch. Very likely his passage through the newly fallen snow loosened its hold, and started the slide on the steep mountain side. There could have been little or no warning,—a first slight movement, followed by the rush and roar of the overwhelming mass, a hurling, stunning blow, followed by quiet and rest. Immovably held, yet softly pilloled in the great white mountain bed, he slept the sleep from which there is no awakening.

ARTHUR WINSLOW.

*General Manager."*

—L. L. DeMerritt is in the Monotype Department of William B. Sellers & Co., Philadelphia.—Albert P. Norris, for two years assistant chemist at the ——— Mills, Lawrence, has given up that line of

work, and has entered the Harvard Medical School.—George A. Moran, '97, has taken Mr. Norris's position.—A. C. Lamb, of the American Writing Paper Company, has been transferred from the South Lee Mills to those of the Nombrick Paper Company at Holyoke.—J. M. Gilmore has been made foreman of the transformer testing room at the Stanley Company, Pittsfield.—Harry D. Hunt, who is proprietor of the *Evening Chronicle*, North Attleboro, has recently been elected representative from the first Bristol District to the General Court of 1900.

1898.

C.-E. A. WINSLOW, *Sec.*

Hotel Oxford, Boston.

Koch is now in the foundry department of William B. Sellers & Co., Philadelphia.—E. C. Sherman is teaching in the Cambridge Evening School.—D. Q. Brown is studying at the Berlin Polytechnic Institute.—C. A. Torrey is studying for an advanced degree at Johns Hopkins.—A. A. Packard, who has been with the Herreshoffs since graduation, made most of the drawings and calculations for

the "Columbia," and overlooked her actual construction.—V. R. Lansingh, A. R. Shedd, and H. E. Sargent are with the Western Electric Company in Chicago.—Miss Forrest, besides teaching a few science classes in the Rogers Hall School, has recently delivered addresses on the African situation and on the Early Races of Europe.—C. W. Pen Dell, who is taking a post-graduate course this year, has been elected to associate membership in the American Institute of Electrical Engineers.—D. H. Blossom, who has been with the Rio Grande Western Railway Company, is now in the office of the Government Surveyor-general for the district of Utah.—E. H. Schroeder is with John Latenser, architect, Omaha, Neb., and is making a specialty of school-house construction.—C. E. Lord gave up his position as assistant in mechanical engineering to become assistant examiner at the United States Patent Office in Washington.—The following engagements are recently announced: F. C. Hastings to Miss Minnie Gates; Z. H. Long to Miss Harriet Cheshire, of Philadelphia; E. B. Paige to Miss

J. W. Cruckshank; C. H. Pease to Miss Mabel H. Proctor, of Somerville; L. J. Seidensticker to Miss Rice, of Cambridge; F. H. Twombly to Miss Ethel Hasbrouck.—The following weddings have been announced to the secretary: April 24, 1899, J. F. Kelly to Miss Cecilia Hurley; June 7, 1899, F. E. Coombs to Miss Ellen L. Monson; June 23, 1899, F. B. Dawes to Miss Cida Taylor; November 14, 1899, F. B. Heathman to Miss Grace L. Brooks; December 20, 1899, R. Harris to Miss Mary C. C. Hacker; December 21, 1899, A. F. Howard to Miss Annie Fletcher.—It is rumored that F. L. Bishop, R. E. Kendall, E. R. Springer, W. F. Steffens, and H. R. Thayer are Benedicts, but particulars are not forthcoming.—Edith Pierpont Stickney, daughter of C. A. Stickney, was born January 7, 1899.—The second graduate reunion of the class of '98 was held at the Vendome, December 30, 1899. At the business meeting preceding the dinner, reports of the secretary and Dinner Committee were read. It was voted that a committee be appointed to arrange

for two or three informal meetings to be held at the club during the coming year. The desirability of issuing a class directory next year was discussed, and the plan was indorsed by vote of the meeting. The secretary was directed to pay to the Association of Class Secretaries the assessment of \$40 levied by that body, and to reimburse the treasury by a class assessment next year. The meeting ended with a discussion of the Walker Memorial Gymnasium Fund, and the election of the following men to serve as a Dinner Committee for next year: F. E. Coombs, I. H. Kaufman, W. E. Putnam, Jr., A. H. Tucker, C.-E. A. Winslow. The dinner which followed was wholly informal, without toast list or set speeches, and was succeeded by a still more informal period, in which chorus singing alternated with a Virginia reel and a team race. The following men were present: J. S. Bleecker, E. S. Chapin, P. Clifford, H. T. Coburn, F. E. Coombs, R. E. Daly, F. B. Dawes, G. F. Hiller, A. H. Jacoby, I. H. Kaufman, A. S. Keen, F. M. Kendall,

W. L. Learned, W. B. Nelson, C. H. Pease, C. W. Pen Dell, W. E. Putnam, Jr., J. T. Robinson, Jr., E. F. Russ, B. F. W. Russell, E. C. Sherman, W. R. Strickland, C. A. Torrey, A. H. Tucker, P. B. Wesson, C.-E. A. Winslow.—G. F. Hiller is singing at the Central Congregational Church in Newtonville, and is also an active member of the Cecilia Club of Boston.—L. D. Gardner is making a study of the subject of Colonial Administration with Professor F. J. Goodnow at Columbia, with a view to advanced degrees.—E. Kuttroff is studying chemistry in Germany at the University of Berlin.—A. L. Davis is an assistant in the Mining Department at Technology.—C.-E. A. Winslow, who has been with the State Board of Health the past summer, has returned to the Institute to fill a vacancy in the Biological Department.—A. H. Jacoby, V., assistant in the Laboratory of Industrial Chemistry, has entered the employ of F. E. Atteaux & Co., manufacturers of dyestuffs and chemicals. He is succeeded by F. E. Busby, V., '97.

1899.

W. O. ADAMS, *Sec.*

1776 Mass. Ave., Cambridge, Mass.

W. O. Sawtelle, VIII., is visiting in Boston, and called on friends at the Institute. — J. A. Fleming, VI., has been in town. — Edward H. Hammond, V., is with the Thomas A. Edison Laboratories for the Edison Portland Cement, Orange, N.J. — Last year the American Protective Tariff League offered a prize of \$150 for the best essay on "The American Merchant Marine: Its Restoration by Means of Discriminative Duties." The competition was open to members of the Senior Class of all colleges in the United States; and the prize was won by Amasa A. Holden, S.B. '99. That the contest was well participated in may be inferred from the fact that, in addition to the award of the prize, honorable mention was accorded to essays submitted from Yale, the University of Pennsylvania, and six other universities and colleges. — W. R. Bean is with Newport News Ship Building & Dry Dock Company. — Stark Newell is now assistant instructor at the

Institute, having left the Maryland Steel Company. — Albert F. Nathan is at present superintendent of the Industrial Zinc Mining Company at Versailles, Mo. — Clarence Moore has lately left the N.H. State Cambric Works, and has accepted a position with the American Steel & Wire Company of Worcester. — Gerald Street is studying at the State School of Mines at Golden, Col. — The first annual reunion of the class of '99 took place at the Hotel Savoy on Saturday, December 23, 1899. A short meeting was held previous to the dinner, which was served at 7 o'clock P.M. At the meeting Mr. Hammond's resignation as vice-secretary was accepted with regret. Miles S. Sherrill was elected vice-secretary. A Dinner Committee, consisting of B. E. Morse and C. M. Swan, was elected. The programme of the dinner was entirely informal, W. O. Adams acting as Toastmaster. The dinner was greatly enjoyed by all. — C. M. Lewis, III., has opened an office as mining engineer and metallurgist at Ketchum, Idaho. His thesis on the best methods of working "Cræsus" ore has proved of



great interest to miners in that vicinity, as evinced by an article in the *Weekly News-Miner*.—K. M. Blake, II., has gone to Paris in the interest of the Stanley Locomobile Company, Limited.—J. A. Patch, X., has returned to take the position of secretary of the Y. M. C. A. He will also do some advanced work at the Institute.—H. P. James, II. and VI., is with the Factory Insurance Company of Boston.—T. F. Lennan, V., is at present located in Joplin, Mo., with Mr. Nicholson, consulting engineer.—Walter O. Adams, X., is with Curtis, Davis & Co., soap-makers, Cambridge, Mass., as chemist.—Harold Ayer, V., is assistant to Dr. Whitney at the Institute.—F. W. Caldwell, II., has been with the Massachusetts Highway Commission all summer.—H. A. B. Campbell, II., is with the Dean & Main Company of Boston, and will soon do some locomotive test-

ing for them on the Pennsylvania Railroad.—A. W. Grosvenor, II., has a very good position as heating and ventilating draughtsman in the Treasury Department at Washington, D.C.—B. S. Hinckley, II., has accepted a position in the Motive Power Department of the Northern Pacific Railway.—Amasa A. Holden, IX., is principal of a high school in West Lebanon, Me.—C. M. Lewis stopped at the Student House, Sunday, November 12, on his way to New York, from which port he sailed on Wednesday, November 15, for China. At the afternoon meeting he gave a brief outline of the work which he is to take up at the Christian College at Canton.—H. J. Skinner, V., is assistant instructor at the Institute.—Frank F. Fowle, VI., has a position as assistant electrical engineer for the American Telephone & Telegraph Company of New York City.

## REVIEWS

THE LIVELY CITY O' LIGG: A CYCLE OF MODERN FAIRY TALES  
FOR CITY CHILDREN

By GELETT BURGESS (M. I. T. '87). Published by Frederick A. Stokes Company.

In the new hemisphere of Fairyland Mr. Burgess here reaches the Furthest North; and the observations made in these rare latitudes and altitudes by a Bachelor of Science should appeal to every father interested in the education of the Technical Imagination of his offspring. The author of the "Lively City o' Ligg" has discovered a new *fauna* in Fairyland. He has laid the foundations for a new branch of Unnatural History, and he has added to literature no inconsiderable contribution of Object Lore.

Like most new ideas, however, hints of the theory so thoroughly exploited in this volume of seventeen stories have been prevalent, though comparatively unnoticed, since the earliest times; but there is little doubt that this latest addition to the bibliography of the subject was directly suggested by Jane Taylor's "Discontented Pendulum," a story familiar to the childhood of our fathers' generation. Stimulated by this fable, two great writers of modern times have devoted themselves to the study and practice of Object Lore,—Rudyard Kipling and Gelett Burgess, representing two sharply contrasted schools. In Kipling's mechanical stories, such as "The Ship that found herself" and "Number .007," we see the best examples of the realistic treatment this *motif* has received; while in the "Lively City o' Ligg" the romantic and poetic point of view has gilded the essential modernness of this practical age with a new beauty, or, at least, with a new interest. To invest commonplace things with such picturesque attributes as are portrayed by Gelett Burgess is a tremendous step forward in the scientific training of the Imagination. The dullest child cannot,

henceforth, go into the street without seeing a new world rattling about his ears. The moral trend of the book, also, will have its effect upon juvenile character; for what little child could ever be cruel to a Locomotive after reading the "Terrible Train"? What boy or girl would tease a Fire Engine or make fun of a twenty-seven-story House after hearing the fables whose lessons are so ingeniously instilled?

In his Preface for Skeptic Parents the author develops the proposition that Inanimate Objects were once endowed with will and action, with a sobriety and lucidity that bring the conclusions of his thesis before the reader as almost inevitable. His whole treatment of the subject is logical and scientific. The Cidivation of Inanimate Objects must rank henceforth, not as a theory, but a well-proven explanation of heretofore inexplicable phenomena. The discussion is based upon an analysis of:—

1. Evidences of prehistoric animation, as shown by Etymology in the gender of words in foreign languages and in English idiom.
2. Evidences of a comatose or degenerate animation in the present condition of Objects themselves.
3. Evidences of degenerate functions and features in Architecture, Mythology, etc.

Mr. Burgess's remarks upon Gender are luminous and retro-active; for he not only indubitably proves by Philology the verity of his premise as to the primeval animation of Objects, but he gives an inverse and strangely simple explanation of the philosophy of Gender itself. He says, . . . "Obviously, where there is evidence of Sex, there must have been Life, one being a function of the other." And so, finding this differentiation in point of Gender prevalent in French, Italian, and Spanish substantives, he draws the justifiable conclusion that Mills, Balloons, Houses, Boats, etc., "must have been known to be, or to have been, animate as late as the rise of the Romance Tongues."

So much we may safely admit, and, we have no doubt, will be universally accepted by Unnatural Scientists; but Mr. Burgess's next deduction is, perhaps, unconvincing, if not absolutely unwarranted. Noticing the fact that many words, such as Cannon and

Boat, for instance, are masculine in French, but feminine in German, he hazards the assertion that "Objects in their animate state had highly developed sexual distinctions, *even amongst things of the same sort.*" \* This assumption we consider unjustified, and becomes inadequate when we seek the explanation of hybrids and sports. Mr. Burgess himself admits, later in the book, that both the Hand Organ and the Æolian Harp were derived from the crossing of pure windmills with Grand Pianos. Does not this prove the offspring to be not hybrid, but strictly legitimate and normal, seeing that the two parents were openly married? Again Mr. Burgess's elaborate and ingenious reconciliation of the German Neuter form with his theory falls to the ground, if we accept his statement *Italicized* above. He is driven to the hypothesis of three different sexes,—an awkward explanation at best, and no whit more satisfactory than the alternative possibility: that here the Neuter stands for an already extinct animation or premature cidivation.

The author has, moreover, emphasized traits particular to particular Objects with an insistence that has all the effect, if not the quality, of sex-distinction, so that his tales are likely to prove at any rate the basis of a useful and attractive Mnemonic system for those baffled by the gender of foreign languages. The terrible Train, the lovesick Piano, the high-strung, mischievous Balloon, the cruel Cannon, the vicious Hansom-cab, the odious Mill, are all virile personifications of masculinity; while as types of the Eternal Feminine we find the fickle House, changing color every night, the Locomotive that never knew her own mind, the inquisitive Church, and the vain Stable.

The second class of phenomena, including present evidences of degenerate animation, are lightly passed over with a reference to Mrs. Walker's "Total Depravity of Inanimate Things"; and doubtless every reader is familiar with her argument, based largely upon the machinations of errant collar-buttons and such small annoyances.

In his discussion of evidences of design and degenerate Thinghood in Architecture, Mr. Burgess's marshalling of facts is con-

\* The Italics are Mr. Burgess's.

summate. He points out the door and window as persistence elements in all ancient Architecture, tracing their effect upon the Renaissance orders and more recent styles, and shows how those primeval organs of eating and seeing have become conventionalized and distorted by the ignorance of man. This is emphasized by a subtle criticism of the modern schools, and any architectural student may read between the lines a dignified protest against the abuse of this theory in the modern examples of what may be termed the "Anthropoid" Order of Architecture. The Preface closes with a suggestive reference to the possible intermixture of the two rival equidominant species when such missing links as the Pianolion, the Giraffopost, and the *Equus Caballustrade* may have given rise to the conception of the monstrous hybrids of Mythology.

The *mise-en-scène* of the book is the lively city of Ligg, which existed somewhere north-west of Wonderland, at that fascinating period when "animals and objects existed contemporaneously, and were equipped with approximately equal powers,"—a fitful era in the terrible struggle for supremacy which culminated in the Cidivation of Things. The human actors are but two. The myth-hero Yak, prototype of the coming race, and the Mayor o' Ligg, demigod and genius, are symbolical of the *Dingerdämmerung* that was to be. The real interest of the stories centres in the Objects whose adventures, comic, tragic, and amorous, are graphically portrayed.

The book abounds in strong character drawing, and is, as has been said, romantic in style, though several moral lessons are disguised in the masque of fable. Easily first in importance and treatment comes the story of the Terrible Train; and here the conflict between the races is cleverly as well as broadly handled, and the inevitable subjugation of the monstrous train is described with a pathos that enlists our sympathies for this unfortunate, if misguided, member of an expiring race. Contrasted with this is the idyll of the Piano in Love, an apotheosis of unrequited affection; while the exquisite comedy of the House who walked in her Sleep, and the Hilarious Hansom, will make those tales classic. The narratives, moreover, are not without dramatic quality; and

some, such as the story of Three Elevators and that of the Bother-some Brig, are distinctly actable.

The book is published in an *édition de luxe*, embellished with fifty-three drawings, eight of which are in color. The pictures are all drawn from life by the author, and are in striking contrast to the text, being literal presentments of the different characters as accurate as scale drawings. It is unfortunate that Mr. Burgess's residence in London, while the book was in preparation, compelled him to illustrate such antiquated types of machines as are found only in England; and the American youth outside of Boston, as yet untouched by Anglomania, will revolt at such puny effeminates as the Fire Engine and the little British Locomotives and Railway Carriages. He will rebel also, if we mistake not, at the diction imposed by publication of these tales serially in the *Queen*; and he will demand, in the next edition, a revision of the text and the deletion of such words as "line" for track, point for switch, "metals" for ties, and the like. The make-up is, indeed, inconsistent, seeing that the "elevator" is still unknown in England. The coloring of the plates is achieved with distinction, being rendered in the Japanese style, which diminishes the hard-and-fast realism of the line work.

#### NEW HIGHER ALGEBRA

BY WEBSTER WELLS, S.B., Professor of Mathematics in the Massachusetts Institute of Technology. Boston, U.S.A., D. C. Heath & Co., 1899.

#### THE ESSENTIALS OF GEOMETRY

BY WEBSTER WELLS, S.B., Professor of Mathematics in the Massachusetts Institute of Technology. Boston, U.S.A., D. C. Heath & Co., 1899.

Professor Wells begins the Preface to his "New Higher Algebra" as follows: "To meet the increased entrance requirements of many American colleges and scientific schools, the author has

prepared a work covering more ground than his 'Higher Algebra,' containing a greater number of examples, and giving more rigorous proofs of fundamental principles."

In reviewing an elementary work in mathematics, it is necessary to keep in mind that it has to serve two purposes: to give the student the fundamental knowledge which he will require in his study of the higher mathematics, and to teach him what he can do with the aid of that subject alone if he can continue his studies no farther. As both these ideas are usually emphasized on entrance examination papers, it is certainly fair to ask how well this book meets these requirements.

The translation of practical problems into "algebraic language" and their subsequent solution by algebraic processes is the main element under the second head. On this point we find very explicit and careful directions for expressing problems in algebraic form, and a large number of problems for practice,—the place where there is the least danger of the work becoming mechanical.

It is, unfortunately, a fact that the student must solve many examples, in order to fix securely the fundamental principles needed in the advanced work; but the teacher should insist upon his being able to prove the formulas and the theorems of algebra with the same accuracy that would be required in geometry. No additional time is needed, as less time may be devoted to example work, which will now become illustrative of principles rather than the mere accomplishment of a certain amount of mechanical labor. More to the credit of this book than its large number of problems is the fact that every formula and theorem is proved in such a way that the student may fairly be required to reproduce the proof in the class-room.

In the "Essentials of Plane and Solid Geometry" a larger and larger share of the work is left to the student as he goes on and increases in power. Always insisting on a reason for each statement, after a few pages the author merely refers to the article in which the reason may be found instead of stating it himself; and, still further on, he only indicates the need of a reason by an interrogation mark, and leaves the student to formulate it for himself.

It is evident that in this way the power to prove original propositions — the real aim of geometry — may be gradually and easily developed. And it is to be noted here that the book contains many originals, a large number of which have accompanying figures.

In solid geometry many students find difficulty in understanding the representation in the plane of figures of three dimensions. To meet this difficulty, Professor Wells has prepared a set of stereoscopic views to accompany the propositions. These views will undoubtedly be of value in stimulating a dull imagination, but should be used only when absolutely necessary, as one of the advantages to be derived from the study of solid geometry is the ability to make a plane representation of any geometrical solid.

Only some of the newer ideas embodied in these two text-books have been noticed, no attempt at an exhaustive review having been made.

#### THE FUNDAMENTAL LAWS OF ELECTROLYTIC CONDUCTION

By Dr. H. M. GOODWIN, Assistant Professor of Physics, M. I. T.  
Harper & Brothers, 1899, New York and London.

This little volume forms one of the series of Harpers' "Scientific Memoirs," edited by J. S. Ames, Ph.D. It is not only admirable in itself, but will be of great value to those interested in electro-chemistry, who are unable to avail themselves of the original papers.

The preface of the book contains a clear statement of the subject-matter. "In the present volume are collected those papers on Electro-chemistry which contain the original statement of the fundamental laws and experiments on which the modern theory of electrolytic conduction is based."

Faraday's paper published in 1834 on the "Law of Electrochemical Action" naturally takes precedence. Following this are translations of Hittorf's memoir on "The Migration of Ions during Electrolyses," and of one by F. Kohlrausch on "The Conductivity of Electrolytes dissolved in Water in Relation to the Migration of their Components."



A short biography of the three celebrated physicists is given. Particularly interesting are the short sketches of Hittorf and Kohlrausch, who have and are still exerting such a marked influence on the physical and chemical thought of the day.

The end of the book contains a very useful bibliography of the leading papers relating to Faraday's Laws, Electro-chemical Equivalent, Transference Numbers, Velocity of Migration, and Absolute Velocities.

"With the establishment of the laws of Faraday, Hittorf, and Kohlrausch, the way was prepared for the dissociation theory of Arrhenius, which was announced in 1886, as soon as the theory of Solutions had been formulated by Vacit Hoff."

The next links in the chain of electro-chemical knowledge were formed by Pfeffer, Vacit Hoff, Arrhenius, and Raoult. They deal with osmotic pressure, dissociation, lowering of the freezing-point, all of which memoirs are to be found in the volume by Dr. H. C. Jones on "The Modern Theory of Solutions."

It is to be regretted that the Harper Series does not contain a volume on the Modern Theory of the Voltaic Cell, since such a volume would complete the series of famous memoirs on Electro-chemistry.

G. V. W.

#### THE BIRDS OF RHODE ISLAND

BY REGINALD HEBER HOWE, JR., and EDWARD STURTEVANT,  
S.B. (M. I. T. '98). 8vo, pp. 111. 1899.

To quote from the authors' preface: "This volume on the Birds of Rhode Island, containing the first complete list of the birds of the State, is offered with the hope that it will lead to the further study of ornithology within Rhode Island, and that it will give a basis on which to build such work." It is a neatly printed, unpretentious volume, with half a dozen attractive illustrations of localities frequented by certain species. The first part of the book is devoted to a brief review of the works on Rhode Island birds,—and there are very few such publications,—a short account of the migration of birds through the State, and an entertaining

chapter on Cormorant Rock, a locality peculiarly favorable for studying the habits of some of the marine birds. The second and principal part of the book is taken up with an annotated list of two hundred and ninety species of birds which have been observed in the State. The notes on the time and place of observation seem to have been worked up with considerable care, and numerous foot-notes give references to the various publications in which the observations have been recorded. Further, three extirpated species are mentioned,—the heath hen, the wild turkey, and the passenger pigeon; and a hypothetical list of ten species gives those whose presence within the State has not been fully proven. A bibliography and two indices, one of scientific names and one of common names, completes the book, which will doubtless prove of no small value to those for whom it is intended.

A. W. W.